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Welcome Aboard: Aircraft Deicing Fluid and the Environmental Epidemic It Is Causing

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WELCOME ABOARD: AIRCRAFT DEICING FLUID AND THE ENVIRONMENTAL EPIDEMIC IT IS CAUSING

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I. INTRODUCTION

THE FEDERAL AVIATION Administration (FAA) has once again missed the flight to environmental consciousness. Aircraft deicing fluids (ADF or ADFs), approved by the FAA to ensure our safety while in the air,[1] are severely harmful to us on the ground.[2] The substances used consist of various chemicals designed to prevent ice and snow from accumulating on the wings and the ground underneath aircraft.[3] Many of these chemicals reach our nation's waters every day, killing fish, polluting drinking water, and destroying habitats.[4] The Environmental Protection Agency (EPA) recently estimated that annual amounts of anti-icing and deicing contaminated runoff are between 300 million and 1.4 trillion gallons.[5]

Following public demand for Congress to take an active role in protecting our nation's waters, various environmental statutes[6] were enacted to require prosecution of polluters, and to

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1 *See infra* § II (discussing the safety requirements of the FAA for flying aircraft in wintry conditions).

2 For a basic introduction to the chemicals used, *see infra* §§ II(B), III.

3 "Deicing" refers to the process of applying chemicals to remove ice or frost from the ground or airplane itself; "anti-icing" refers to applying chemicals to prevent future accumulation of frost or ice. U.S. ENVTL. PROT. AGENCY, EPA-821-R-00-016, PRELIMINARY DATA SUMMARY AIRPORT DEICING OPERATIONS (REVISED) 4–5 (2000), *available at* http://www.epa.gov/waterscience/guide/airport/airport.pdf [hereinafter PRELIMINARY]. For purposes of this paper, the acronym "ADF" will be used to describe both anti-icers and deicers.

4 *Id.* at 1–1.

5 *Id.* at 5–6.

6 *See infra* § IV.

minimize the environmental impacts of direct and indirect sources of pollution.[7] Unfortunately, because the FAA is an administrative agency that has almost exclusive control over airports,[8] little regulation has been implemented to reduce ADF pollution. Thus, progress toward Congress's national pollution-reduction goals has been slow with respect to airports.

This Article begins with a discussion of how the FAA has regulated or failed to regulate the deicing and anti-icing processes at airports. Section III analyses the ongoing environmental impact deicing and anti-icing fluids have on our nation's waters. Section IV briefly presents some implications that the Clean Water Act[9] and the National Environmental Policy Act of 1969[10] have on the FAA. Section V then discusses the current conflicts that exist between the EPA and the FAA. Section VI discusses how case law has handled the problems associated with the pollution of waters surrounding airports. Section VII presents an in-depth look at new developments in technology and alternatives that the FAA should take to be more environmentally friendly while deicing aircraft. This Article concludes with proposed solutions to some of the problems associated with the discharge of ADFs.

II. DEICING PROCEDURES

Ice and frost accumulations on an airplane's wings impede airflow, prevent a plane from flying properly, and significantly contribute to accidents.[11] However, despite the various forms of winter precipitation that Mother Nature sends our way, airports often remain open and accessible to aircraft. Much of this accessibility is due in large part to various forms of anti-icers and deicers. Such substances prevent water from freezing at thirty-

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[7] *See generally* MICHAEL S. SWITZENBAUM ET AL., UNIV. OF MASS./AMHERST, PUBL'N NO. 173, WORKSHOP: BEST MANAGEMENT PRACTICES FOR AIRPORT DEICING STORMWATER 1 (1999), *available at* http://www.umass.edu/tei/wrrc/WRRC2004/pdf/Switz173.pdf (stating that in the last ten years, a shift has occurred in regulations away from direct and toward indirect sources of pollution).

[8] Fed. Aviation Admin., Summary of Activities, http://faa.gov/about/mission/activities/ (last visited Nov. 11, 2007).

[9] *See* 42 U.S.C. § 4321 et. seq. (2000).

[10] *See* 33 U.S.C. § 1342 et. seq. (2000).

[11] Wendy B. Davis & Rebecca Clarke, *Hot Air: Undue Judicial Deference to Federal Aviation Administration Expertise in Assessing the Environmental Impacts of Aviation*, 69 J. AIR L. & COM. 709, 733 (2004); PRELIMINARY, *supra* note 3, at 12–2 to 12–3.

two degrees Fahrenheit.[12] Because ADFs prevent ice buildup and are intertwined with aircraft safety, the FAA plays an active role in regulating the process of aircraft and airport ice removal.

A. FAA Regulations

The FAA promulgates and enforces rules on how a pilot is to operate an airplane in wintry conditions.[13] In order to be cleared by the FAA to operate a plane during inclement winter weather, a pilot must comply with an "approved ground deicing/anti-icing program."[14] Such a program includes an authorized "pretakeoff check" that must take place within five minutes prior to takeoff to ensure that no ice or snow has accumulated on any of the designated surfaces.[15] If no snow or ice is reasonably expected, the pilot is authorized to fly the plane without any further inspections.[16]

If snow or ice is imminent, expected, or occurring, a pilot must follow more highly regulated procedures. To fly in these conditions, the FAA requires a pilot to be certified in various safety procedures, including aircraft deicing.[17] In addition, the aircraft must have an approved deicing system.[18] This system includes in-depth requirements for how a jet is to be checked and how any ice or snow is to be removed.[19] A test must also be conducted on the adequacy of such a system in order to show that a plane is capable of operating safely in wintry weather.[20]

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[12] Steve Ritter, *What's That Stuff? Aircraft Deicers*, CHEM. & ENG'G NEWS, Jan. 1, 2001, at 30, *available at* http://www.pubs.acs.org/cen/whatstuff/stuff/7901scit5.html.

[13] *See* 49 U.S.C.A. § 44722 (West 2007) ("The Administrator of the [FAA] shall prescribe regulations requiring procedures to improve safety of aircraft operations during winter conditions."). The FAA prevents any person from allowing a plane to takeoff, operate, or land when the pilot or "aircraft dispatcher" believes that icing may affect the safety of that flight. 14 C.F.R. § 121.629(a)–(b) (2007). A pilot is also prohibited from "tak[ing] off . . . when frost, ice, or snow is adhering to the wings, control surfaces, propellers, engine inglets, or other critical surfaces of the aircraft . . . ." *Id.* § 121.629(b).

[14] 14 C.F.R. § 121.629(c).

[15] § 121.629(c)(4).

[16] § 121.629(b).

[17] 14 C.F.R. §§ 125.5, 125.221(b), 125.287(a) (2007).

[18] § 121.629(c). The FAA defines "aircraft" as "a device that is used or intended to be used for flight in the air." 14 C.F.R. § 1.1 (2007).

[19] 14 C.F.R. § 121.629(c)(1).

[20] 14 C.F.R. pt. 125 app. C (2007).

An approved deicing system must include methods to remove snow and ice from a plane.[21] Ice forms when large or small droplets of moisture are in the air during subfreezing temperatures;[22] therefore, aircraft are susceptible to icy conditions while on the ground as well as during takeoff and landing.[23] Ice on the ground can cause aircraft to skid, and ice on an airplane can interfere with the airflow around the wings.[24] Thus, the FAA has approved specific chemicals that may be applied to prevent frozen precipitation and atmospheric moisture from interfering.[25]

B. Chemical Dependency

Jet aircraft and smaller propeller planes usually have several options for deicing under FAA guidelines. Unfortunately, the preferred method involves the application of chemicals to the ground as well as to the aircraft.[26] The FAA has approved various chemical compounds termed Types I, II, III, and IV for deicing;[27] however, no guidance has been provided on which Type airlines should use.[28]

According to the FAA, "Type I fluids are Newtonian (unthickened) fluids and Type II fluids are non-Newtonian (thickened) fluids . . . . Fluids are glycol-based . . . with additives, such as

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21 § 121.629(c).

22 Fed. Aviation Admin., Advisory Circular No. 91-51A, Effect of Icing on Aircraft Control and Airplane Deice and Anti-Ice Systems 1–2 (1996), *available at* http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/451296dbdf212c81862569e70077c8f9/$FILE/AC91-51A.pdf [hereinafter Advisory Circular No. 91-51A]. The FAA defines three types of ice: clear, rime, or mixed. *Id.* "Rime ice forms if the droplets are small and freeze immediately when contacting the aircraft surface. . . . Clear ice is usually formed from larger water droplets or freezing rain that can spread over a surface. . . . Mixed ice is a mixture of clear ice and rime ice." *Id.* at 2.

23 *See* James T. Riley, Fed. Aviation Admin., Electronic Aircraft Icing Handbook ch. 3 § 3.4 (2001), *available at* http://aar400.tc.faa.gov/Programs/FlightSafety/icing/C3s3.pdf.

24 *See* Advisory Circular No. 91-51A, *supra* note 22, at 2–3. Fed. Aviation Admin., Advisory Circular No. AC 750/5200-3A, Airport Winter Safety and Operations ¶ 8(b) (1991) [hereinafter Airport Winter Safety].

25 *See generally* 49 U.S.C.A. § 44722 (West 2007) ("[T]he Administrator [of the FAA] shall consider . . . the availability of different types of deicing fluids (considering their efficacy and environmental limitations) . . .").

26 Airport Winter Safety, *supra* note 24, at ¶ 24(2)–(b).

27 Fed. Aviation Admin., FAA-Approved Deicing Program Updates 1 (2004), *available at* http://www.faa.gov/library/manuals/examiners_inspectors/8400/fsat/media/fsat0405.doc; Preliminary, *supra* note 3, at 4–7.

28 Preliminary, *supra* note 3, at 4–8.

wetting agents, inhibitors, etc. . . ."[29] Type IV fluid "ha[s] the longest holdover time of any type of fluid. [It is] typically composed of either ethylene glycol or propylene glycol, a small amount of thickener, water, and additives."[30] Fluid Types II, III, and IV coat the aircraft to prevent ice or snow from forming while Type I is used to remove the ice and snow from the aircraft.[31] Type IV fluid is the most beneficial to airlines because the aircraft will remain ice-free for longer periods;[32] however, it also generates the most problems in attempting to mitigate pollution. Because Types II, III, and IV coat the aircraft, much of these fluids are spread across large areas of ground as an airplane takes off.[33] In contrast, the majority of Type I fluid is locally dispersed at the site of application.[34] Thus, Type I fluid pollution is limited to a smaller area and therefore is easier to maintain.

At present, Type I fluid is most commonly used to deice aircraft,[35] but some airlines continue to use Types II and IV.[36] In addition to various additives, these fluids contain various concentrations of the chemicals ethylene or propylene glycol.[37] According to the EPA, between fifty and sixty percent of current formulations of Type I fluid are propylene or ethylene glycol.[38]

Anti-icing agents used on the ground also often contain ethylene and propylene glycol.[39] Anti-icers may additionally include the chemicals potassium acetate, calcium magnesium acetate, sodium acetate, sodium formate, and urea.[40] Because many of these chemicals are different concentrations of salt and sand, the impact on humans is less than with deicers.[41] On the other hand, because all of these chemicals have major environmental

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29 OFFICE OF AVIATION RES., U.S. DEP'T OF TRANSP., SURVEY OF NONGLYCOL AND REDUCED GLYCOL AIRCRAFT DEICING METHODS 35–36 (1999), *available at* http://aar400.tc.faa.gov/acc/accompdocs/99-18.pdf [hereinafter SURVEY].

30 PRELIMINARY, *supra* note 3, at 15–9.

31 *Id.* at 4–7.

32 SWITZENBAUM ET AL., *supra* note 7, at 5.

33 *Id.*

34 *Id.* at 3.

35 PRELIMINARY, *supra* note 3, at 4–7.

36 *See id.* at 4–8 ("Type III fluids are not currently used, and are not available for purchase.").

37 *Id.* at 4–7.

38 *Id.* at 4–9.

39 *Id.* at 4–15 to 4–16.

40 *Id.* at 4–16.

41 *See infra* Part III for a discussion of the environmental impacts of the chemicals in ADFs.

impacts, the FAA has, to a limited extent, also regulated how and where such fluids can be applied.

C. Deicing Procedure and Deicing Pads

The FAA recommends that airports have deicing facilities[42] appropriate to their maximum projected need.[43] The FAA provides two options for airports to determine where to place deicing facilities: (1) "[c]entralized [d]eicing [f]acilit[ies];" or (2) "[r]emote [d]eicing [f]acilit[ies]."[44] A centralized deicing facility is an area at the terminal or adjacent to the taxiways leading to the departure runways.[45] A remote deicing facility is either located along the taxiways or at the end of the departure runways.[46] These facilities contain at least one pad for deicing the aircraft with ADFs.[47]

Showing little concern for the environment, the FAA does not require the minimization of environmental impacts with respect to deicing. No guidance is given for deicing that takes place off the deicing pad—such as on runways.[48] However, for deicing pads, the FAA states that all shall contain "environmental runoff mitigation measure[s]."[49] Despite a listing of restrictions on the location of deicing pads,[50] the FAA does not further define what types of mitigation measures are necessary. Additionally, no requirements are given for airports that have existing deicing pads with little or no environmental runoff mitigation system.[51] The FAA merely provides some recommendations for airport developers and designers to consider during construction. The highest suggestion consists of three simple words: "control the source."[52] According to the FAA, this short expression refers to the collection and recycling of ADFs.[53] Collecting and recycling

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42 The FAA defines a deicing facility as a place where the aircraft is deiced, or a place where the clean surfaces of the aircraft are anti-iced to prevent ice accumulations, or both. Fed. Aviation Admin., Advisory Circular No. 150/5300-14, Design of Aircraft Deicing Facilities 1 (1993) [hereinafter Advisory Circular No. 150/5300-14].

43 *Id.* at 6.

44 *Id.* at 1.

45 *Id.*

46 *Id.*

47 *Id.* at 5.

48 *See id.*

49 *Id.* at 5.

50 *See id.* at 5–6.

51 *See id.*

52 *Id.* at 19.

53 *Id.*

are ambitious goals; however, more specific regulations are necessary to require the implementation of cost effective and environmentally sound methodology.[54]

The FAA does, however, suggest some alternatives to a collection and recycling system. These alternatives include off-site biological treatment of wastewater, disposal to sewage systems, recycling, detention basins, underground storage tanks, and a diversion system.[55] Yet, the FAA has not provided any clear guidance on exactly how such systems are to be designed or implemented. This ambiguity has led to an inconsistent and haphazard approach by airports in implementing methods to address the discharge of ADFs. Such low priority to control discharges of ADFs has had serious environmental impacts.

III. ENVIRONMENTAL IMPACTS

The nation's waters are severely polluted.[56] The runoff generated from deicing and anti-icing agents in winter months is a major contributor to such pollution.[57] The EPA recently estimated anti-icing and deicing contaminated runoff to be between 300 million and 1.4 trillion gallons per year.[58] Much of this pollution occurs when ADFs are applied to the aircraft prior to takeoff.[59] The remaining pollution occurs when ADFs are deposited from the plane when taxiing or during takeoff.[60] As discussed below, ethylene and propylene glycol, as well as various

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[54] This is one of the roots of the problem. The FAA has released several circulars addressing ADF handling; however, none are specific enough to set clear guidelines. *See id.*; *see also* FED. AVIATION ADMIN., U.S. DEP'T OF TRANSP., ADVISORY CIRCULAR NO. 150/5320-15, CHANGE 1 TO MANAGEMENT OF AIRPORT WASTE 1, 6 (1997), *available at* http://www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars/media/150-5320-15/150_5320_15_chg1.pdf [hereinafter ADVISORY CIRCULAR NO. 1501 5320-15]. Both of these circulars address the need for regulating the discharge of ADFs, but both only recommend some options and do not require any specific action to be taken.

[55] ADVISORY CIRCULAR NO. 150/5320-15, *supra* note 54, at 23–24; ADVISORY CIRCULAR NO. 150/5300-14, *supra* note 42, at 19–20.

[56] *See* James Boyd, *The New Face of the Clean Water Act: A Critical View of the EPA's New TMDL Rules*, 11 DUKE ENVTL. L. & POL'Y F. 39, 44 (2000) (stating that "the nation's waters remain significantly polluted").

[57] PRELIMINARY, *supra* note 3, at 1–1. *See also* Davis & Clarke, *supra* note 11, at 733–34 (stating that glycols are major contributors to the pollution generated from airports).

[58] PRELIMINARY, *supra* note 3, at 5–6.

[59] SWITZENBAUM ET AL., *supra* note 7, at 8.

[60] *Id.*

other additives contained in ADFs, are the leading source of such pollution.

ADFs have both directly and indirectly contributed to the environmental epidemic.[61] Direct contamination occurs when rainwater mixes with ADF and enters "[u]nprotected storm water drains."[62] Indirect contamination occurs when ADFs percolate into soil, reach groundwater, and eventually contaminate surface waters.[63] The EPA has reported that twenty-one million gallons of fluid containing glycol enter surface waters each year from airport emissions.[64] Researchers from the University of Massachusetts have further found that as much as ninety-six percent of all ADFs are lost as runoff.[65]

A. Glycols: Hazards to the Environment and Your Health

ADFs are largely considered to be hazardous to both human and animal health.[66] As pointed out by Davis and Clarke, "[e]thylene glycol is toxic to mammals, including humans, and can cause neurological, cardiovascular, and gastrointestinal problems, severe birth defects, and death."[67] Ethylene glycol is also classified as a federal hazardous air pollutant.[68]

Based on numerous requests by concerned activist groups,[69] the EPA recently conducted a toxicological study on ethylene

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61 Preliminary, *supra* note 3, at 5–6.

62 U.S. Envtl. Prot. Agency, EPA 816-F-02-018, Source Water Protection Practices Bulletin Managing Aircraft and Airfield Deicing Operations to Prevent Contamination of Drinking Water 2 (2002), *available at* http://www.epa.gov/safewater/sourcewater/pubs/fs_swpp_deicingair.pdf [hereinafter Source Water Protection].

63 *Id.*; *see also* Wendy B. Davis, *Reasonable Use Has Become the Common Enemy: An Overview of the Standards Applied to Diffused Surface Water and the Resulting Depletion of Aquifers*, 9 Alb. L. Envtl. Outlook J. 1, 28–29 (2004).

64 Preliminary, *supra* note 3, at 1–4.

65 Jolene J. Johnson et al., Univ. of Mass./Amherst, Comparative Toxicity of Formulated Glycol Deicers and Pure Ethylene and Propylene Glycol 1 (2001), *available at* http://www.umass.edu/tei/wrrc/WRRC2004/pdf/no.174.pdf.

66 *See* Ritter, *supra* note 12; Agency for Toxic Substances and Disease Registry, Ethylene Glycol and Propylene Glycol 1–2 (1997), *available at* http://www.atsdr.cdc.gov/tfacts96.pdf.

67 Davis & Clarke, *supra* note 11, at 733; *see also* Source Water Protection, *supra* note 62, at 2.

68 *See* Source Water Protection, *supra* note 62, at 2; Switzenbaum et al., *supra* note 7, at 9.

69 *See* Switzenbaum et al., *supra* note 7, at 14.

glycol.[70] The results confirmed that the chemical causes harmful deposits in the human body that can lead to serious health problems.[71] In addition, pregnant mice exposed to ethylene glycol produced young that had a higher rate of malformations and decreased birth weights.[72] Propylene glycol, on the other hand, is not as toxic to humans as ethylene glycol;[73] however, the chemical poses significant environmental concerns similar to those posed by ethylene glycol.

Prior to about 1999, researchers regarded ADFs as relatively nontoxic to the environment because glycols, standing alone, are biodegradable in water.[74] What they failed to realize, however, is that glycols have a high oxygen demand as they break down in water.[75] This means that the chemicals deplete water of oxygen, thereby suffocating numerous aquatic life forms.[76] In essence, propylene and ethylene glycol are responsible for numerous fish kills and for the generation of deadly bacteria.[77]

Scientific tests conducted on the waters surrounding airports have confirmed the deadly nature of glycol-related oxygen depletion.[78] When airports discharge high levels of ADFs, the amount of fish living in surrounding water dramatically decreases.[79] The EPA has reported that ADFs have been found to be responsible for:

> (1) [A]quatic life effects such as fish kills, growth of biological slimes, elimination of aquatic life, stressed invertebrate communities, and impaired fisheries; (2) effects on wildlife, birds and cattle; (3) human health problems (worker and population exposure - headaches, nausea); (4) aesthetic effects (odor, color,

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[70] *See generally* Notice of Filing a Pesticide Petition to Establish a Tolerance for a Certain Pesticide Chemical in or on Food, 69 Fed. Reg. 47,149 (Aug. 4, 2004) (to be codified at 40 C.F.R. pt. 180).

[71] 69 Fed. Reg. at 47,152.

[72] 69 Fed. Reg. at 47,151–52.

[73] *See* 21 C.F.R. § 172.850 (2007) (stating that propylene glycol may be used as a food additive if certain requirements are met).

[74] *See* Lila Guterman, *Toxic Takeoffs*, NEW SCIENTIST, Jan. 9, 1999, at 77; SWITZENBAUM ET AL., *supra* note 7, at 13–14.

[75] *See* SOURCE WATER PROTECTION, *supra* note 62, at 2.

[76] *Id.*; Davis & Clarke, *supra* note 11, at 733.

[77] *See* SOURCE WATER PROTECTION, *supra* note 62, at 2; PRELIMINARY, *supra* note 3, at 10–16; SWITZENBAUM ET AL., *supra* note 7, at 13–14; Ritter, *supra* note 12.

[78] *See* Guterman, *supra* note 74, at 77.

[79] *Id.*

foaming); and (5) effects on the quality of receiving waters . . . , groundwater, water supplies, and soils.[80]

Additionally, in a study conducted in Wisconsin, researchers found that all of the aquatic life died when placed in a stream with high levels of ADFs.[81] During the summer months when no ADFs were used, eighty percent of the same species survived.[82] Such tests are indicative of the environmental impact glycols can have on fish and other aquatic life.

B. As if Glycols Are Not Enough, Additives Seal the Deal

Although glycols alone can be dangerous, when taken in conjunction with all other additives, ADFs are *severely* toxic to the environment and humans.[83] ADFs contain substances such as corrosion inhibitors, flame retardants, wetting agents, and thickeners.[84] Many types of ADFs comprise different levels of these agents; however, little is known because manufacturers consider the compounds to be secret formulas.[85] These additives have yet to be regulated by the FAA or Congress.[86]

According to researchers at the University of Massachusetts, "some [of the] detected additives [in ADFs] include: diethylene glycol, ethylene oxide, acetaldehyde, dioxane, high-molecular-weight polymers, polyamines, triazoles, ureas, sodium nitrate, sodium benzoate, borax, and benzotriazoles; all or some of these additives may be responsible for increased toxicity."[87] Many of these chemicals were found to be moderately or extremely toxic to human beings and aquatic life, and some may produce known carcinogens.[88] Unfortunately, even though many ADF

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80 PRELIMINARY, *supra* note 3, at 10–16. The EPA does note, however, that some of the airports used in the studies have since made improvements to decrease the amount of ADFs that are discharged. *Id.* at 10–17.

81 *See* Guterman, *supra* note 74, at 77.

82 *Id.*

83 *See* PRELIMINARY, *supra* note 3, at 10–16 ("New concerns with the aquatic toxicity of ADF additives were . . . noted . . . ."); Davis & Clarke, *supra* note 11, at 733; Envtl. News Network Staff, *Airplane De-icer Found to Pollute Groundwater*, CNN, Jan. 8, 1999, http://www.cnn.com/TECH/science/9901/08/deicing.enn/index.html.

84 SOURCE WATER PROTECTION, *supra* note 62, at 2; JOHNSON ET AL., *supra* note 65, at 9–10.

85 SOURCE WATER PROTECTION, *supra* note 62, at 1.

86 *See* JOHNSON ET AL., *supra* note 65, at 2.

87 *Id.* at 9.

88 *See id.* at 9–10; PRELIMINARY, *supra* note 3, at 9–11 to 9–14.

compounds have been identified as hazardous, more remain unknown. While unregulated companies continue to reform the compositions of such chemicals,[89] human health and the environment have remained susceptible, vulnerable, and damaged. The FAA has failed in providing any regulatory structure to ensure environmental soundness and human safety.

IV. DISREGARDED CONGRESSIONAL ACTIONS

A. THE "QUASI" CLEAN WATER ACT

The Federal Clean Water Act (CWA) prohibits the discharge of a pollutant from a point source[90] into navigable water[91] without obtaining a National Pollution Discharge Elimination System (NPDES) permit.[92] Airports must obtain such a permit in order to legally discharge ADFs.[93] Although state-specific,[94] NPDES permits often include requirements that airports develop "Storm Water Pollution Prevention Plans."[95] Such plans may contain:

> [(1)] Description[s] of potential pollutant sources and a site map indicating the locations of aircraft and runway deicing/anti-icing operations and identification of any pollutant or pollutant parameter of concern . . . . [(2)] Description[s] of storm water discharge management controls appropriate for each area of operation . . . . [(3)] Consideration[s] of alternatives to glycol- and urea- based deicing/anti-icing chemicals to reduce the aggregate amount of deicing chemicals used and/or lessen the environmental impact . . . . [(4)] Evaluation[s] of whether deicing/anti-icing over-application is occurring and adjustment as necessary . . . . [and] [(5)] Employee training on topics such as spill re-

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89 *See* JOHNSON ET AL., *supra* note 65, at 7.

90 The CWA defines a point source as "any discernible, confined and discrete conveyance . . . ." 33 U.S.C. § 1362(14) (2000).

91 The CWA defines navigable waters broadly as "the waters of the United States, including the territorial seas." 33 U.S.C. § 1362(7).

92 33 U.S.C. §§ 1311(a), 1342, 1362(12) (2000); Davis & Clarke, *supra* note 11, at 733. For a basic understanding of how an airport may obtain a permit, see Sally A. Longroy, *The Regulation of Storm Water Runoff and its Impact on Aviation*, 58 J. AIR L. & COM. 555, 599–601 (1992). For a discussion on other applicable environmental statutes, *see* Davis & Clarke, *supra* note 11, at 711–18.

93 40 C.F.R. § 122.26(a)(1)(ii), (b)(14)(viii) (2007); Davis & Clarke, *supra* note 11, at 733.

94 *See* Envtl. Prot. Agency, EPA Guide to Environmental Issues, http://www.p2pays.org/ref/21/20659.htm (last visited Nov. 12, 2007). ("Most states have legal authority to implement and enforce the provisions of the Clean Water Act, while EPA retains oversight responsibilities for most state water programs.").

95 SOURCE WATER PROTECTION, *supra* note 62, at 5.

sponse, good housekeeping, and material management practices for all personnel that work in the deicing/anti-icing area.[96]

Requiring airports to consider alternatives and describe implemented control measures is a notable accomplishment. Once again, however, there are no specifics. No consequences are listed if an airport *considers* alternatives and simply rejects them.

The NPDES permit system is a step in the right direction. Unfortunately, the step is a very small one. Although NPDES permits are required, airports are not limited in the amount of ADFs they may discharge or the type of chemicals they can use.[97] Such leeway renders an NPDES permit almost useless. More specific guidelines as to the types of acceptable chemical combinations and alternatives required for the use of such chemicals are needed. Only then can NPDES airport permit requirements have significant positive impacts on the environment and human safety.

B. The National Environmental Policy Act

Similar to the CWA, the National Environmental Policy Act (NEPA) is aimed at decreasing the amount of pollutants entering the environment.[98] The statute requires the FAA and other federal agencies to prepare an Environmental Impact Statement (EIS) prior to engaging in activities that significantly influence the environment.[99] According to Davis and Clarke, "[t]he EIS must include a discussion of the environmental impact of the proposed action and any reasonable alternative actions. The EIS must consider all foreseeable direct and indirect effects, and the consideration given must amount to a 'hard look' at the environmental effects."[100]

In order to determine whether an EIS is required in a particular case, the FAA prepares an Environmental Assessment (EA).[101] An EA is a brief determination of whether an EIS should be prepared or if a finding of no significant impact is more appropriate.[102] The determination must include "brief discussions of the need for the proposal, of alternatives . . . [con-

96 *Id.*
97 Davis & Clarke, *supra* note 11, at 733.
98 42 U.S.C. § 4321 et. seq. (2000).
99 42 U.S.C. § 4332(2)(C); *see also* Davis & Clarke, *supra* note 11, at 711.
100 Davis & Clarke, *supra* note 11, at 712.
101 *Id.* at 711–12; 40 C.F.R. §§ 1501.3, 1501.4(a), (c) (2007).
102 Sierra Club v. Espy, 38 F.3d 792, 796 (5th Cir. 1994).

sidered], of the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted."[103] If the FAA finds no significant impact is more appropriate, no EIS is required, and the agency can proceed in compliance with NEPA.[104]

NEPA gives the FAA immense opportunity to disregard environmental concerns. Although the statute does mandate some environmental considerations,[105] it is more of a procedural hurdle for the FAA to overcome than one of policy.[106] An EA is often used as a means to disregard the formal requirements of NEPA and to forgo the preparation of an EIS.[107] Additionally, courts have shown great deference to the FAA,[108] contributing to the agency's power to disregard full environmental considerations. Thus, NEPA is not a valuable statute to limit FAA actions that have major impacts on the environment.[109]

V. FAA VS. EPA: A FIGHT NEVER WON

The FAA is not the only agency to blame for the lackadaisical approach to implementing clear and effective environmentally-friendly ADF regulations. Undoubtedly, the EPA and the FAA have different goals: the FAA oversees aircraft safety[110] and the EPA oversees environmental and human health issues.[111] While the FAA has not implemented any substantial regulations limiting the discharges of ADFs, the EPA[112] has not been active in

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[103] 40 C.F.R. § 1508.9(b) (2007).

[104] *Sierra Club*, 38 F.3d at 796.

[105] James T.B. Tripp & Nathan G. Alley, *Streamlining NEPA's Environmental Review Process: Suggestions for Agency Reform*, 12 N.Y.U. ENVTL. L.J. 74, 79 (2003).

[106] *Sierra Club*, 38 F.3d at 796 ("NEPA is, of course, a procedural statute, mandating a process rather than a result.").

[107] Tripp & Alley, *supra* note 105, at 80 ("Agencies often produce [findings of no significant impacts] in the EA process—it is one strategy for avoiding the strictures of the EIS.").

[108] *See infra* § VI.

[109] *See* Andrew C. Mergen, *The Changing Nature of Airport Environmental Litigation*, 18 AIR & SPACE L. 1, 21 (2004) ("NEPA is a procedural and not substantive statute and does not prevent a federal agency from undertaking, authorizing, or funding a federal action that adversely affects the environment.")

[110] Fed. Aviation Admin., Summary of Activities, http://faa.gov/about/mission/activities/ (last visited Nov. 12, 2007).

[111] Envtl. Prot. Agency, Our Mission, http://www.epa.gov/epahome/aboutepa.htm#mission (last visited Nov. 12, 2007).

[112] The EPA has recently announced that it is sending out surveys to reflect on the current state of deicing operations. Agency Information Collection Activities, 70 Fed. Reg. 61,813–14 (Oct. 26, 2005). According to the EPA, the results will be used "to select airline locations for responding to the detailed airline question-

developing and enforcing uniform permit restrictions that do not conflict with the FAA's safety interests. The Office of the Inspector General for the Department of Transportation has concluded that the EPA:

> (1) [I]s inconsistent in approving how air carriers interpret and implement deicing regulations, (2) does not adequately analyze results of its deicing inspections to improve the safety of air carrier deicing operations, (3) has shortfalls in its method of selecting special emphasis airports and in its airport operator regulations, (4) has little impact on facilitating the construction of deicing facilities, and (5) lacks technical, in-house icing expertise.[113]P

Such a critique is indicative of a true problem: neither agency has given priority to balancing solutions to the environmental epidemic with decisions that do not conflict with aircraft safety.

As a solution to the problem, Davis and Clarke suggest that the EPA and the FAA work together in making "aviation decisions that affect the environment."[114] Further, when the FAA makes decisions that greatly affect the environment without consulting the EPA, such decisions should be "deemed arbitrary or capricious."[115] Forcing two independent administrative agencies to work together is a noble goal; however, nothing can be done without a specific act of Congress or an agency agreement to cooperate.[116]

VI. FAILED ATTEMPTS TO COMPLY AND THE LAW'S REACTION

Regulatory ambiguity, congressional ambiguity, and the overlap in administrative responsibilities have contributed to courts' reluctance to enforce standards and impose guidelines on airports for discharging ADFs.[117] Historically, the FAA has had a record success rate in courts and has rarely been enjoined from

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naire." *Id.* Unfortunately, the opportunity for the EPA to take any significant action on the questionnaires is severely limited by the deference given to the FAA over the operation of airports. *See* Davis & Clarke, *supra* note 11, at 709–10.

[113] OFFICE OF THE INSPECTOR GEN., U.S. DEP'T OF TRANSP., REPORT ON FAA DEICING PROGRAM AT LA GUARDIA AND O'HARE AIRPORTS 9 (1996), *available at* http://ntl.bts.gov/lib/1000/1500/1543/e5-fa-7-002.pdf.

[114] Davis & Clarke, *supra* note 11, at 710.

[115] *Id.* at 742.

[116] *See id.* ("Congress should give authority to the EPA to oversee decisions of the FAA that will impact the environment.").

[117] *See id.* at 710 ("[F]ederal courts accord the FAA excessive and inappropriate deference . . . . Such deference is inappropriate when the FAA decides that pro-

action that has adverse effects on the environment.[118] Few cases have been brought before courts, and even fewer cases have been published in official reporters. The limited legal precedents are indicative of the ambiguity of the exact frameworks of the law.

A. *Buchholz v. Dayton International Airport*: Where it All Began

The first case that dealt with the environmental impact of unregulated discharges of ADFs into the waters surrounding an airport occurred in the Southern District of Ohio.[119] There, Dayton International Airport discharged ADF into a creek that eventually flowed into plaintiffs' properties.[120] The ADF killed over 2000 fish and crayfish, created odd water coloration, glycol and chemical odors, and foaming of the water.[121] It was not until nearby residents started to complain that the Ohio EPA became involved.[122]

In *Buchholz*, despite continuing problems with discharging ADFs,[123] Dayton International Airport was granted an NPDES permit to release the chemicals from several sources.[124] The permit restricted the airport from discharging substances in amounts "which would cause noticeable accumulations of foam and result in discoloration or odor to such a degree as to cause a nuisance."[125] On several occasions, the discharges from the airport clearly violated the permit restrictions and again severely contaminated Mill Creek.[126]

Despite the NPDES permit violations, "[t]he airport ha[d] never received a notice of violation from Ohio EPA or any other State agency relating to discharges . . . ."[127] After discussing the

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posed action will have no adverse effect on the environment because the FAA has no expertise in environmental concerns.").

118 Mergen, *supra* note 109, at 20–22; *see also* Davis & Clarke, *supra* note 11, at 710.

119 Buchholz v. Dayton Int'l Airport, No. C-3-94-435, 1995 WL 811897, at *4–*8 (S.D. Ohio Oct. 30, 1995). *See also* Davis & Clarke, *supra* note 11, at 734 (discussing the *Buchholz* case).

120 *Buchholz*, 1995 WL 811897, at *4–*6.

121 *Id.* at *7; Davis & Clarke, *supra* note 11, at 734.

122 *Buchholz*, 1995 WL 811897, at *7–*8.

123 *See id.* at *7, *8, *10.

124 *Id.* at *8.

125 *Id.*

126 *Id.* at *10–*13.

127 *Id.* at *17.

toxicity of ADFs,[128] the court granted a preliminary injunction deferring to the airport's efforts to reduce its discharges of ADFs through the incorporation of remedial measures.[129] Additionally, the airport was required to submit a plan to the court and follow the previously established permit guidelines.[130]

The *Buchholz* decision is indicative of the lack of compliance with NPDES permit restrictions. Unfortunately, the decision is reactive and not proactive. The NPDES permit only placed restrictions on discharges to the extent that they created a public nuisance.[131] This ignored the environmental impacts so long as they were unnoticed by human beings.[132] Additionally, such permit restrictions also ignore the connectivity of water.[133] Polluted surface water can contaminate ground water and eventually have negative influences on aquatic and human health.[134]

B. *Price v. County of Westchester* and SEQRA

The next case that presents some of the problems associated with current regulations of ADF occurred at the Westchester County Airport, located in New York.[135] After commencing construction, the airport applied for and received an NPDES permit to discharge ADF into a local lake.[136] According to the Third Department, although "excessive amounts of ethylene glycol" were permitted to be discharged, the airport still violated the permit restrictions.[137] Owners of adjoining land brought suit claiming that the airport's construction did not comply with NEPA and the New York State Environmental Quality Review Act (SEQRA).[138] The court held that because the airport had

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128 *See id.* at *16–*17.

129 *Id.* at *24.

130 *Id.* at *26.

131 *Id.* at *8.

132 *Id.*

133 "Unless captured for recycling, recovery, or treatment, deicing agents will run off onto bare or vegetated ground where they may travel through the soil and enter ground water, or run off into streams." SOURCE WATER PROTECTION, *supra* note 62, at 2. *See also* Davis, *supra* note 63, at 733.

134 *See* SOURCE WATER PROTECTION, *supra* note 62, at 2.

135 *See generally* Price v. County of Westchester, 650 N.Y.S.2d 839 (N.Y. App. Div. 1996).

136 *Id.* at 841.

137 *Id.*

138 *Id.* at 840. SEQRA is the state of New York's attempt to regulate activities that may have negative impacts on the environment. *See* N.Y. ENVTL. CONSERV. LAW § 8-0101 (McKinney 2005). Similar to the NEPA, SEQRA requires an envi-

submitted a generic environmental impact statement,[139] it complied with SEQRA.[140] The airport was permitted to continue construction and its attempts to divert storm water.[141]

The holding in *Price* is indicative of the problem with controlling the discharge of ADFs. The court once again deferred to agency power and did not impose injunctive relief to prevent the pollution of local waters.[142] In turn, the landowners were forced to adhere to the airport's commitment to future action,[143] and the local waters continued to be inundated with glycols and additives.[144] Foaming and fish kills continue to occur, generating public outcry and legal action by the State University of New York at Purchase as well as the New York State Department of Environmental Conservation (DEC).[145] The County of Westchester consistently *plans* on addressing the problem;[146] however, as of 2001, it had yet to do so.[147]

In New York, state regulations attempting to include environmental considerations into agency decisions suffer from similar setbacks as the federal statutes discussed above. Nothing in SEQRA states exactly what is required to receive a general permit.[148] The regulation only suggests some guidelines, including the possible inclusion of some "hypothetical scenarios that could and are likely to occur."[149] The exact scope of the hypotheticals are not defined,[150] giving airports immense defer-

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ronmental impact statement to be prepared prior to any state action that may have a drastic effect on the environment. § 8-0109.

139 *Price*, 650 N.Y.S.2d at 840. Under SEQRA, a general permit can be obtained in order to establish compliance. N.Y. COMP. CODES R. & REGS. tit. 6, §§ 617.10(a), (d)(1) (2005). This general permit is drafted by the seeking agency and is sent to the State Department of Environmental Conservation. *Id.* § 617.12(b)(6). In *Price*, the environmental assessment and general permit did consider the impacts on surface runoff, the proposed retention basin, the effects of the construction, the flora and fauna, and the nearby wetlands. *Price*, 650 N.Y.S.2d at 842.

140 *Price*, 650 N.Y.S.2d at 842.

141 *Id.*

142 *Id.*

143 *Id.*

144 SWITZENBAUM ET AL., *supra* note 7, at 42.

145 *Id.*

146 *Id.*

147 *But see generally* FIRST EVN'T. INC., INVESTIGATION REPORT AND GROUNDWATER MONITORING PROGRAM (2001), *available at* http://www.westchestergov.com/airport/groundwater_monitoring_program.htm_Toc507307293.

148 *See* N.Y. COMP. CODES R. & REGS. tit. 6, § 617.10(a) (2005).

149 *Id.*

150 *Id.*

ence to pick and choose which situations are to be considered. Further, because each agency is individually responsible for implementing SEQRA with limited overview by the DEC,[151] agencies have little incentive to report pollution that actually occurs.

VII. FORGOTTEN AND OVERLOOKED NEW TECHNOLOGY

The time has come for the FAA to take more responsibility and regulate *exactly* which types of deicing systems are acceptable and which are not.[152] Giving airports discretion in deciding which ADF mitigation measures to implement has resulted in numerous environmentally hazardous forms of deicing systems. Additionally, some "solutions" employed by airports are not solutions at all. Many just perpetuate the problems associated with ADF discharges. Thus, environmentally friendly alternatives remain overlooked and disregarded.

A. Method One: Hot Water

One alternative to the use of ADFs involves application of hot water to an airplane's wings.[153] In Europe, the use of hot water as part of a two step process in deicing aircraft has successfully reduced the amount of necessary ADFs.[154] The water is applied prior to the application of other chemicals.[155] Hot-water deicing reduces the amount of ADF necessary to deice the aircraft.[156]

Citing the complexities and risks associated with hot water deicing, no airports in the United States currently use this as a method to deice aircraft.[157] Hot water application requires special training because the determination of appropriate amounts in relation to weather conditions is highly subjective.[158] Moreover, this option has not proven entirely effective in reducing gly-

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151 *See* John W. Caffry, *The Substantive Reach of SEQRA: Aesthetics, Findings, and Non-Enforcement of SEQRA's Substantive Mandate*, 65 Alb. L. Rev. 393, 395 (2001).

152 The FAA has provided a list of reasons why each airport's requirements are different; however, there is an extensive list of technological alternatives that can be employed to circumvent these differences. *See* Advisory Circular No. 150/5300-14, *supra* note 42, at 6–8.

153 Survey, *supra* note 29, at 2.

154 *Id.* at 4.

155 *Id.* at 3.

156 *See id.*

157 Preliminary, *supra* note 3, at 6–16. At least one airline in Canada has attempted this approach. *See* Survey, *supra* note 29, at 2.

158 Survey, *supra* note 29, at 4.

col amounts because ground crews have been known to err on the side of caution and use excessive amounts of ADFs.[159] Still, despite the success of the two-step system in Europe, no airports in the United States currently employ it.[160] However, a copy of this design could maintain air safety and decrease the amount of necessary ADFs.

B. Method Two: Projected Need

As opposed to having premixed solutions of glycol delivered to the airports, the airports can instead mix the solutions to conform to their exact projected need.[161] For example, Delta Airlines has employed a "Local Area Expert" who determines the formula to safely deice aircraft with minimal glycol usage.[162] In addition, at Denver International Airport, the glycol concentrations are reduced by increasing or decreasing the amount of water in ADF depending on the applicable air temperature.[163] Northwest Airlines has also adjusted the glycol concentrations at various airports to conform to historical patterns in temperatures.[164]

Although lower glycol concentrations have been employed in the past, this solution does not fully address the problem. While the ADF amounts may be decreased, the glycol usage remains very high.[165] Absent further action to recycle or reuse ADF, these airports are still contaminating the environment with glycols and other additives. Additionally, mixing chemicals on-site increases the chance of spills and leakage of storage facilities. In this sense, highly trained personnel must be kept aware of the dangers of the chemicals entering the environment. Such training may be overly expensive and cost-ineffective to implement.

C. Method Three: Forced Air

Another option involves the use of forced air to blow the snow and ice accumulations from an airplane's wings.[166] For years, Nippon Airlines in Japan has used air to eliminate dry snow

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159 *Id.*

160 *Id.*

161 Preliminary, *supra* note 3, at 6–17.

162 *Id.*

163 *Id.*

164 *Id.*

165 *See generally id.* (stating that Delta Airlines has at times been able to decrease glycol usage by twenty percent).

166 *Id.* at 6–6.

from airplanes as an inexpensive substitute for glycols.[167] At General Mitchell International Airport in Milwaukee, Wisconsin, Delta Airlines has employed a hybrid system that combines hot air with a valve that limits the amount of ADFs.[168] This unit not only decreases the overall usage of ADFs, but also appropriates an amount of fluid necessary to meet the conditions of that day.[169] Between 1997 and 1998, when Delta implemented this system, the amount of ADFs used decreased from 18,000 gallons to 3500 gallons; a decline of approximately eighty percent.[170]

D. Method Four: Computer Gantry System

A fourth solution that has potential to eliminate large amounts of ADFs involves a computer gantry system.[171] This system works similar to a carwash: the sprayers are computerized, remain close to the plane, and can be adjusted depending on the conditions of the day.[172] The leftover ADF is then collected and either recycled or sent to a waste treatment plant.[173] Some claim that a computer gantry system can reduce glycol usage by as much as eighty percent.[174]

Although the EPA has stated that computer gantry systems are quick and efficient, no airports in the United States currently use such a system.[175] Several airports in Europe currently have computer gantry systems, and several versions of the system are available.[176] Opponents of gantry systems argue that they require too much of an initial investment, are inefficient, and cannot deice all of the necessary components of an aircraft.[177] Because of these reasons, several European airports have stopped using such systems.[178]

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167 *Id.*

168 *See* Switzenbaum et al., *supra* note 7, at 4; Preliminary, *supra* note 3, at 6–7.

169 Switzenbaum et al., *supra* note 7, at 4 & tbl. 2.

170 *Id.*

171 Preliminary, *supra* note 3, at 6–9.

172 *Id.* at 6–10; Switzenbaum et al., *supra* note 7, at 6.

173 Preliminary, *supra* note 3, at 6–9.

174 *Id.* at 6–11.

175 *Id.* at 6–9, 6–11.

176 *Id.* at 6–10.

177 *Id.* at 6–11.

178 *Id.*

E. METHOD FIVE: INFRARED HEATING SYSTEMS

Another alternative that has been used to drastically decrease the amount of ADFs involves heat.[179] One system in particular has proven successful and has been approved by the FAA.[180] Radiant Energy Corporation developed a heated structure, into which aircraft are brought in order to melt any ice and snow buildup.[181] The heat is generated from infrared heaters powered by natural gas.[182] One such structure has been implemented at Buffalo-Niagara International Airport, in Buffalo, New York.[183] The design allows for the deicing of aircraft in the same amount of time and for $4,650 less per airplane than traditional glycol based ADFs.[184] Furthermore, the system has no harmful effects on aircraft.[185]

One drawback of the Radiant Energy design is its size, as the structure must be large enough to accommodate an airplane.[186] Another drawback is the system's inability to prevent ice buildup once a plane leaves the hangar.[187] In order to combat this problem, ADFs are still necessary; however, the amounts used can be decreased by up to ninety percent.[188]

F. METHOD SIX: COLLECTION SYSTEM; WASTE MANAGEMENT SYSTEM

Collection systems that consist of deicing pads and drainage systems are the most effective option for implementation. According to the EPA:

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179 *See* SWITZENBAUM ET AL., *supra* note 7, at 6.

180 RADIANT ENERGY CORP., FACT SHEET 1 (2004), *available at* http://www.radiantenergycorp.com/downloads/Factsheet.pdf. In addition to Radiant Energy, the company Ice Cat has developed a similar system that is portable. PRELIMINARY, *supra* note 3, at 6–15. This system has yet to be implemented. *Id.* Moreover, another company, Sun Lase, Inc., is working on developing an infrared laser beam process to eliminate ice and snow buildup. *Id.* at 6–16.

181 PRELIMINARY, *supra* note 3, at 6–12.

182 *Id.*

183 *Id.* at 6–13; *see also American Airlines Receives OK for Radiant Energy Deicing System*, BUFF. BUS. FIRST, Oct. 17, 2001, *available at* http://www.bizjournals.com/buffalo/stories/2001/10/15/daily25.html.

184 PRELIMINARY, *supra* note 3, at 6–12, 6–14. The dollar amount given is based on the cost to deice a Boeing 727. *Id.* at 6–14.

185 *Id.* at 6–12.

186 *See id.* at 6–14.

187 *See id.* at 6–13.

188 *Id.*

> Airports use a variety of collection methods, including gate and ramp area drainage collection systems, storm sewer plugs, designated aircraft deicing pads, temporary aircraft deicing pads, storm drain valves, and specially designed glycol-vacuum vehicles. . . . Collected wastewater may then be processed to recycle/ recover glycol, treated on site, discharged to a publicly owned treatment works (POTW), or a combination of these methods.[189]

One airport has led the way to being both environmentally savvy and efficient at the same time: Albany International Airport, located in upstate New York, has developed a method to use, recycle, and reuse ADFs.[190] The system works by filtering out propylene glycol from rain runoff and converting it to methane gas, carbon dioxide, and biomass.[191] In addition, concrete pads are used to hold snow containing glycols until it melts in order to collect and recycle the chemicals.[192] The methane gas then generates free heat for one of the airport structures.[193] According to Davis and Clarke, "[t]he end product of the cycle is clean water and harmless gases."[194]

The EPA has estimated that Albany International Airport collects between fifteen and twenty-five million gallons of ADF annually.[195] This collection has been successful in eliminating ADF pollution: besides testing negative for all glycols, the area surrounding the airport has also tested negative for the presence of ADF additives.[196]

A different version of this system exists at several airports in Europe.[197] This approach implements a distillation and evaporation system that separates harmful and safe chemicals.[198] According to the EPA, such a system, if designed correctly, can eliminate the harmful chemicals of ADFs.[199] The EPA does note, however, that this version of a recovery system may not be cost-effective.[200] Further, distillation-based systems generate

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189 Id. at 6–26.

190 *See* Davis & Clarke, *supra* note 11, at 741.

191 *Id.*; *see also* PRELIMINARY, *supra* note 3, at 7–14.

192 PRELIMINARY, *supra* note 3, at 6–44.

193 *Id.* at 7–14; Davis & Clarke, *supra* note 11, at 741.

194 Davis & Clarke, *supra* note 11, at 741.

195 PRELIMINARY, *supra* note 3, at 5–5.

196 *Id.* at 7–14, 7–15.

197 *See* OFFICE OF WATER, U.S. ENVTL. PROT. AGENCY, STORM WATER TECHNOLOGY FACT SHEET 2 (1999), *available at* http://www.epa.gov/owmitnet/mtb/airplnde.pdf.

198 *Id.* at 1–3.

199 *Id.* at 3–4.

200 *Id.* at 4–5.

concerns about emissions entering the air.[201] If large enough, these emissions may violate statutes such as the Clean Air Act.[202]

Various fluid recovery systems, such as the one in place at Albany International Airport, are likely the most reasonable solution to the environmental epidemic. This is one technology that has clearly worked; in turn, this proves that implementing technology can curtail the environmental problems associated with ADFs.

VIII. CALLS FOR CHANGE

The environment is being inundated with chemicals that are harmful to humans and aquatic life. The EPA and scientists have determined that a major reduction in the amount of these chemicals is necessary to maintain water quality and safety. Unfortunately, the FAA has yet to take an active role in mitigating the heavy dependency on the usage of chemicals to deice aircraft.

Clearly, technology currently exists to eliminate or substantially reduce the amount of glycols and additives that are released into waters of the United States.[203] Some airports, such as Albany International, have greatly reduced the amount of ADFs that are arbitrarily discharged onto land and into water.[204] However, allowing airports to choose which type of ADF mitigation procedures to use is ineffective. Further guidance is necessary from the EPA and the FAA to instruct airports on which options *must* be considered and chosen. In order to alleviate the con-

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201 *See id.* at 3 ("the air emissions from the distillation process through losses from condenser vents, accumulator tank vents, and storage tank vents must be considered.").

202 *See generally* United States *ex rel.* Nguyen v. City of Cleveland, Nos. 1:00CV208, 1:03CV1563, 2005 WL 2416925, at *3 n.9 (N.D. Ohio Sept. 30, 2005). In *Nguyen*, plaintiff brought suit against the Cleveland and Toledo Airports in Ohio. *Id.* at *1. Specifically, plaintiff alleged that the airports violated the False Claims Act by lying about complying with the Clean Air Act, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, and the Emergency Planning and Community Right-to-Know Act of 1986. *Id.* at *2. Under all three of these acts, the chemical ethylene glycol is listed as hazardous. *Id.* at *3. Similar to the Clean Water Act, these Acts require either a permit to discharge ethylene and propylene glycol or notice if discharging such chemicals in large quantities. *Id.* at *2. The court did not consider the environmental violations and granted defendants' motion for summary judgment on the False Claims Act issue. *Id.* at *11–*12. For a more in-depth discussion of the Clean Air Act, *see generally* Davis & Clarke, *supra* note 11, at 716–17.

203 *See generally* PRELIMINARY, *supra* note 3, at 1–3 to 1–4.

204 Davis & Clarke, *supra* note 11, at 741.

flicts between agencies, the creation of a committee—consisting of members from both the EPA and FAA—should be considered. In turn, both agencies' goals can be met: air and environmental safety.

If the FAA maintains its lackadaisical approach to regulating ADF discharges, at a minimum, some form of economic incentive should be given. The EPA has stated that economic incentives are a valuable and resourceful way to make changes that are environmentally friendly.[205] In this sense, the FAA can achieve environmental soundness without making black-letter rules that must be followed.

Additionally, as can be witnessed in *Buchholz* and *Price*, even when courts have reviewed disputes over ADF discharges, great deference has been given to the FAA, airports, and the EPA. Such deference is not appropriate because an effectual action plan has not been implemented by the airports or the agencies. The *Buchholz* court, in particular, had an enormous opportunity to make a difference; however, little was accomplished as a result.

The regulation of ADF additives should be a top priority for the FAA and EPA. Additives exacerbate the environmental degradation that results from the discharge of ADFs. Because little is known about exactly which chemical additives are in ADFs, the FAA and the EPA are not aware of the additional dangers some of these chemicals may be causing. Additionally, protecting trade secrets, such as the chemical make-up of ADFs, fails to protect humans or the environment. Companies producing ADFs should not be able to use this excuse to forgo health and safety considerations. The FAA and the EPA must realize that environmental degradation cannot be stopped until effective legal guidelines are imposed to restrict additives to environmentally safe products. Something should be done now; the longer the FAA waits, the more human and environmental safety will be compromised.

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[205] *See* OFFICE OF POLICY, ECONOMICS, & INNOVATION, U.S. ENVTL. PROT. AGENCY, EPA-240-R-01-001, THE UNITED STATES EXPERIENCE WITH ECONOMIC INCENTIVES FOR PROTECTING THE ENVIRONMENT i–iv (2001), *available at* http://yosemite.epa.gov/ee/epa/eermfile.nsf/vwAN/EE-0216B-01.pdf/$FILE/EE-0216B-01.pdf.