Regulating Pesticide Pollution in California under the 1986 Safe Drinking Water and Toxic Exposure Act (Proposition 65)

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Proposition 65,\textsuperscript{1} enacted to keep toxic chemicals out of drinking water and to require businesses to warn citizens whenever they expose them to such chemicals, represents an important potential tool for the regulation of pesticide manufacture and use. Despite opposition from industry, the initiative, also known as the "Safe Drinking Water and Toxic Enforcement Act of 1986," passed with an overwhelming 62\% margin. The simple promise of Proposition 65 and its overwhelming approval by the voters tends to overshadow the Statute's complexity and uniqueness. Proposition 65 may be the only environmental statute to adopt the precautionary principle in regulation, which it does by placing the burden on industry to show that the release of a toxic chemical is not harmful and by imposing protective health-based standards to guide that determination.\textsuperscript{2} Proposition 65 also furthers the public's right to know about toxic chemicals to which it is exposed by requiring responsible companies to disclose exposure information in the form of warnings.\textsuperscript{3} Finally, Proposition 65 offers a unique means of enforcing these protective standards by not only allowing private parties to bring their own enforcement actions when the state declines to participate, but by offering financial incentives in the form of 25 \% of the significant potential penalties.\textsuperscript{4}

\begin{notes}
\item See \textit{Cal. Health & Safety Code} § 25,249.5 \textit{et seq.} (West 2000). This Article will from time to time refer to Proposition 65 as the "Statute."
\item See \textit{Cal. Health & Safety Code} §§ 25,249.9–25,249.11 (West 2000); see \textit{infra} notes 35-77 and accompanying discussion.
\item See \textit{Cal. Health & Safety Code} § 25,249.6 (West 2000); \textit{infra} note 10.
\end{notes}
A very different regulatory picture is presented by the federal and state laws that currently address the use of pesticides in California. Under these laws, the burden of showing that a pesticide is "harmful" to the environment lies with the enforcement agency or, more commonly, citizens groups. The safety standards for pesticide pollution are not exclusively health based, but rather involve a deliberate risk-benefit balancing, in which the food production benefits of pesticide use are compared to the risks posed to the public and the environment by a particular pesticide product.\(^5\) In direct contrast to the public disclosure required by Proposition 65, information on the timing of pesticide use and occurrence of exposures is inaccessible, held primarily in the hands of an often under-enforcing governmental agency and not available to the public.\(^6\) Finally, these pesticide laws offer the public minimal opportunities to influence enforcement levels. Instead, citizens generally are limited to lobbying federal and state agencies to carry out their discretionary enforcement authority, often to little effect.

This article will compare the regulation of pesticides under Proposition 65 with the regulatory regime currently in place in California. Sections I and II of the article provide an overview of Proposition 65 and current law regarding pesticide regulation. Section III evaluates the possibilities for application of the Statute to pesticide use in California. Section IV addresses issues impacting the future of pesticide regulation and concludes that, in contrast to traditional command and control environmental statutes, Proposition 65 could effectively address the non-point source pollution characteristic of pesticide use by focusing on the end exposure or release instead of the release mechanism. Listing of pesticides under Proposition 65 has the potential to force manufacturers and users to internalize pesticide pollution costs currently borne by society, leading to more accurate societal choices regarding the amount and types of pesticides we are willing to introduce intentionally into the environment.

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5. See infra notes 96-100 and accompanying discussion.
OVERVIEW OF PROPOSITION 65

Proposition 65 adopts a dual-pronged regulatory approach based on protection and information.\(^7\) The Statute accomplishes these twin objectives by prohibiting any "person in the course of doing business"\(^8\) from knowingly discharging or releasing a listed toxic chemical into a source of drinking water ("discharge prohibition")\(^9\) or from knowingly and intentionally exposing any individual to such chemicals without first providing a warning ("warning requirement").\(^10\) These provisions apply to all toxic chemicals listed under the statute as "known to the state to cause cancer or reproductive toxicity."\(^11\)

This section discusses Proposition 65's structure, particularly as it relates to the control of non-point source air

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\(^7\) This approach is derived from the original ballot argument that drinking water should be protected from toxic chemicals and persons should be informed whenever they are exposed to such chemicals. See Ira Reiner, Art Torres & Penny Newman, *Argument in Favor of Proposition 65*, CALIFORNIA BALLOT PAMPHLET: GENERAL ELECTION 54 (Nov. 4, 1986). The California Supreme Court has taken the people's mandate at face value, holding that the protective purposes of Proposition 65 are to be broadly construed. See People ex. rel. Lungren v. Super. Ct. (American Standard, Inc.), 14 Cal. 4th 294, 314 (1996).

\(^8\) Consistent with its stated intention to focus on large corporate polluters, Proposition 65 does not apply to government agencies, operators of public water systems, or small businesses (less than 10 employees). See CAL. HEALTH & SAFETY CODE § 25,249.11(b) (West 2000) (defining a "person in the course of doing business").

\(^9\) The discharge prohibition states:

No person in the course of doing business shall knowingly discharge or release a chemical known to the state to cause cancer or reproductive toxicity into water or onto or into land where such chemical passes or probably will pass into any source of drinking water, notwithstanding any other provision or authorization of law except as provided in Section 25249.9.

CAL. HEALTH & SAFETY CODE § 25,249.5 (West 2000).

\(^10\) The warning requirement states: No person in the course of doing business shall knowingly and intentionally expose any individual to a chemical known to the state to cause cancer or reproductive toxicity without first giving clear and reasonable warning to such individual, except as provided in Section 25,249.9. CAL. HEALTH & SAFETY CODE § 25,249.6 (West 2000).

\(^11\) See CAL. HEALTH & SAFETY CODE §§ 25,249.5, 25,249.6 & 25,249.8 (West 2000). A chemical will be considered to be a carcinogen or reproductive toxicant if the state lead agency (the Office of Environmental Health Hazard Assessment ("OEHHA")) makes such a determination based on well-accepted, scientifically valid testing, or if a state or federal agency, or other "body considered to be authoritative" reaches a similar conclusion. See CAL. HEALTH & SAFETY CODE § 25,249.8(b) (West 2000); infra notes 237-243 and accompanying discussion. Not surprisingly, given the high stakes involved, the listing of chemicals under the Statute is typically a highly contentious process, in which citizen groups, industry and OEHHA staff wrangle over testing protocols and risk analyses. See infra notes 244-261 and accompanying discussion.
and water pollution. Proposition 65's dual goals—prohibiting discharges of toxic chemicals into sources of drinking water and requiring a warning for individual exposures—make the statute an ideal vehicle to combat the types of non-point source pesticide pollution that have thus far escaped the more conventional command and control statutes protecting air and water. Enforcement of the statute is carried out through provisions for injunctive relief and monetary penalties, which may be enforced by the state Attorney General, local government attorneys, or private parties where no state or local enforcement action is occurring. The Statute allows a private enforcing party to keep 25% of the monetary penalty, thus creating a strong incentive for private enforcement actions and leading many

12. CAL. HEALTH & SAFETY CODE § 25,249.7(a) (West 2000).
13. CAL. HEALTH & SAFETY CODE § 25,249.7(b) (West 2000) (stating that "any person who has violated § 25,249.5 or § 25,249.6 shall be liable for a civil penalty not to exceed $2500 per day for each violation in addition to any other penalty established by law.")
14. See CAL. HEALTH & SAFETY CODE § 25,249.7 (West 2000). In order to prosecute a Proposition 65 violation, a private party must first give 60 days notice to the Attorney General and the local district or city attorney in whose jurisdiction the violation is alleged to have occurred. The private party's action may only be commenced if neither the Attorney General nor the local district or city attorney chooses to prosecute the alleged violation itself. CAL. HEALTH & SAFETY CODE § 25,249.7(d)(2) (West 2000). Depending upon the circumstances, the AG's office often will allow a private party to maintain the suit where it has done the majority of the preliminary work to bring the case. Assistant Attorney General Craig Thompson, personal communication [hereinafter Thompson, pers. comm.]; Brief for Amicus Curiae People of the State of California in Opposition to Defendants' Motion for Judgment on the Pleadings on Standing Grounds at 6, Natural Resources Defense Council et. al. v. Lucky Stores, Inc. (Los Angeles Super. Ct. August 10, 1999) (No. 190090) [hereinafter, AG Brief] ("participation and assistance of private plaintiffs in a complex and technical case . . . enables the Attorney General to spread [its] resources over a wider field, thus enhancing enforcement of the statute"); Letter from Roderick E. Walston, Chief Assistant Attorney General, to Fred H. Altshuler, Altshuler, Berzon, Nussbaum, Berzon & Rubin 1 (Sept. 16, 1997) (on file with author) ("certainly there is room for broad cooperation between the Attorney General and private parties in carrying out their enforcement responsibilities under Proposition 65").
15. In addition to being allowed to keep 25% of the penalty award, private parties may also be entitled to attorney's fees under CAL. CODE OF CIVIL PROC. § 1021.5. Historically, private parties also were able to obtain disgorgement of unlawfully obtained profits under California's Unfair Competition Act. See CAL. BUS. & PROFESSIONS CODE §§ 17,203, 17,204 (West 1997); People v. Thomas Shelton Powers, M.D., Inc., 2 Cal. App. 4th 330, 341-343 (1992) (holding that even in the absence of direct victims, illicit profits may be disgorged to party in a position to use them to correct, as much as possible, the harm caused by defendant's action and to prevent the wrongdoer from retaining the benefits of an illegal act). The ability of private plaintiffs to bring such actions has since been limited to class action suits by the Supreme Court's decision in Kraus v. Trinity Mgmt. Servs., 23 Cal. 4th 116, 137 (2000). Since many environmental cases do not create a distinct "class" of injured
industry representatives to characterize Proposition 65 as a “bounty hunter” statute. The variety of novel and influential enforcement cases brought by private parties is testament, however, to the importance of private enforcement to the overall effectiveness of the statute.

A. Standards of Liability and Burden Shifting

The basic structure of all Proposition 65 litigation involves a two step process. To prove liability, a plaintiff must first establish a knowing discharge, or a knowing and intentional exposure, of a “detectable amount” of a listed chemical. If a plaintiff can make this showing, the burden shifts to the defendant to establish that the discharge or exposure was insignificant or “de minimis.”

1. Plaintiff’s Burden to Establish a Knowing Discharge or Exposure

A plaintiff initially establishes a knowing discharge or exposure by showing that the defendant was aware of its release of a listed chemical into the environment, and that the...
discharge or exposure was a foreseeable consequence of the defendant's act. A defendant cannot avoid liability by simply pleading ignorance, since it may be charged with constructive knowledge of both Proposition 65's chemical list and of the potential health risks presented by its commercial operations.

A plaintiff may meet its burden of showing a measurable discharge or exposure by detecting any amount—even a single molecule—of a toxic chemical according to an approved "method of analysis." The regulations set forth a hierarchy of four approved analytical methods, beginning with methods "adopted or employed" by state agencies and descending in order of authority to methods used by federal agencies, methods generally accepted within the scientific community, and, if none of the other three categories are applicable, a "valid scientific method." A plaintiff will most easily meet its burden if it uses a detection method already "adopted or employed" by a state or federal agency. For many types of discharges or exposures, however, no agency approved detection method has been adopted. In these cases, a plaintiff must argue that its selected detection method is "generally accepted" or "scientifically valid," often in the face of withering critique from defendant's experts.

note 7 (statute applies "only to businesses that know they are putting one of the [known carcinogenic] chemicals out into the environment") (italics in original).

19. Statement of Reasons for CAL. CODE REGS. tit. 22, § 12601(d), at 39-40 ("Use of the term foreseeable is intended to define the limits of that constructive knowledge and of exposures for which businesses can reasonably be held responsible").

20. See, e.g., Statement of Reasons for CAL. CODE REGS. tit. 22, § 12601(d) at 39 ("The Agency interprets the requirement that exposures be "knowing and intentional" to include exposures about which there is constructive knowledge."). See also Statement of Reasons for CAL. CODE REGS. tit. 22, § 12601(b), at 9 ("it was not the Agency's intention that [the foreseeable language] apply only to reasonably intended exposures.").

21. See CAL. HEALTH & SAFETY CODE §§ 25.249.10(b)(1), 25.249.11(c) (West 2000) ("significant amount" includes "any detectable amount" of a listed chemical).

22. CAL. CODE REGS. tit. 22, § 12901(g) (2001) reads "For purposes of [the discharge provision and the warning requirement], no discharge, release or exposure occurs unless a listed chemical is detectable as provided in this section."


24. CAL. CODE REGS. tit. 22, § 12901(b) (2001). This group includes local air pollution control districts and regional water quality control boards.

25. For example, no state or federal agency has formally adopted a method of testing the amount of lead that leaches into faucet water from leaded brass plumbing fixtures.

26. See also People v. Venegas, 18 Cal. 4th 47, 85 (1998) ("General acceptance... means a consensus drawn from a typical cross-section of the relevant, qualified scientific community"); People v. Kelly, 17 Cal. 3d. 24, 31 (1976). A defendant may not overcome a plaintiff's showing of validity by showing the existence of another "preferred" method of analysis within the same categorical tier. Instead, a defendant must show that the plaintiff's detection method is either invalid or not
The stakes of this debate are raised by the regulatory allowance of modeling as an appropriate method of analysis. Using modeling techniques, for example, a plaintiff may establish a detectable amount of a toxic chemical without actually measuring the exposure or discharge in question, based on modeling estimates derived from initial release data.

2. Defendant’s Burden to Show that Discharge or Exposure is Insignificant

If a plaintiff establishes a knowing discharge of or exposure to a listed chemical, the defendant can avoid liability only by showing that the amount of the discharge or exposure is insignificant or “de minimis.” By placing this burden on the defendant, Proposition 65 creates a strong incentive for businesses to ensure that de minimis levels, below which they will have no liability, are established. The agencies have responded by establishing such “safe harbors” for approximately one-third of the listed carcinogens and for three reproductive

generally accepted, or has been displaced by a detection method from a higher tier. See CAL. CODE REGS. tit. 22, § 12901(d)-(e) (2001) (“When more than one method of analysis [exists within the same tier], each may be utilized as the method of analysis.”).

27. CAL. CODE REGS. tit. 22, § 12901(f) (2001). The regulatory history of Proposition 65 further demonstrates that the Statute does not require “actual detection” of a listed chemical, but only that the chemicals be present in a detectable amount. See Statement of Reasons for CAL. CODE REGS. tit. 22, § 12901, at 15 (“regulation only requires that the listed chemical be ‘detectable,’ not actually detected”); infra notes 321-328. Modeling intensifies the debate between the parties’ experts as to the validity of the underlying science.


29. Proposition 65 does not regulate discharges of or exposures to amounts of carcinogens posing “no significant risk” or amounts of reproductive toxicants having “no observable effect” at 1000 times the measured exposure. CAL. HEALTH & SAFETY CODE §§ 25,249.9, 25,249.10(c), & 25,249.11(c) (West 2000). See infra notes 42-58 and accompanying discussion. Under the discharge prohibition, the defendant must also show that the discharge complies with all laws regulations and permits. See CAL. HEALTH & SAFETY CODE § 25,249.9(b)(2) (West 2000). Thus, if a defendant’s discharge is out of compliance with any applicable law or permit, a plaintiff may successfully claim a Proposition 65 violation based on any detectable amount of discharge or release.

Industry may rely on these levels to avoid liability, but they do not limit the defendant's ability to present its own risk assessment at trial to show that a particular exposure or discharge exceeding a safe harbor level is nevertheless safe. Through this innovative—and controversial—approach, Proposition 65 has largely avoided the delays in regulatory risk assessment and standard-setting that characterize other environmental laws which defer liability until a specific risk level is established by the appropriate agency.

B. The Preventative Approach of Proposition 65: Risk Assessment and the Discharge Prohibition

The drafters of Proposition 65 were aware that a liability-oriented approach to environmental protection, in which businesses are only responsible for their own chemical discharges, could fail to protect citizens from the many potential sources of toxic chemicals unless conservative assumptions were built into the Statute. These conservative assumptions, which form the basis of Proposition 65’s protective regulatory approach, underlie the Statute’s risk assessment procedures and its determination of liability under the discharge prohibition. According to the California Supreme Court, these provisions are to be "broadly construed" in order to further the protective purposes of the Statute, and to implement the will of the voters to protect themselves from toxic contamination.

31. See CAL. CODE REGS. tit. 22, § 12705 (2001) (safe harbor levels for carcinogens); § 12805 (safe harbor levels for reproductive toxicants). The three reproductive toxicants with safe harbor levels are lead, ethylene oxide and toluene.

32. CAL. CODE REGS. tit. 22, §§ 12701(a), 12801(a) (2001). As a general matter, defendants have tended not to challenge OEHHA's regulatory safe harbor levels.

33. Critics have referred to the burden of proof shift as the "guilty until proven innocent provision." Frank Clifford, State Curbs on Household Chemicals Under Attack, 9 PROP 65 NEWS, Mar. 1995, at 5, 9.

34. By March 1995, the Office of Environmental Health Hazard Assessment had set exposure limits for over 40% of the toxic chemicals on the Proposition 65 list, while the federal EPA had established safe limits for only two dozen toxic chemicals. See Roe, supra note 30; Well Testimony, supra note 16, at 5-7; Clifford Rechtschaffen, The Warning Game: Evaluating Warnings Under California's Proposition 65, 23 ECOLOGY L.Q. 303, 311 n.36 (1996); see also David Roe & Gilbert Ommen, California Has Successful Model of Regulatory Risk Assessment, 10 PROP 65 NEWS, Mar. 1996, at 10.

35. See CAL. CODE REGS. tit. 22, §§ 12721(a), 12821(a) (2001).

1. Protective Risk Assessment Under Proposition 65

Risk assessment plays an especially crucial role under Proposition 65 since liability depends not on a showing of actual injury or detection of a pollutant concentration exceeding a predetermined regulatory standard but rather on whether an exposure or discharge exceeds a specific risk level. Proposition 65's risk assessment requirements are specifically designed to address carcinogens and reproductive toxicants, and the Statute adopts a conservative approach to both these toxic chemical groups. For carcinogens, which are assumed to pose a chronic risk to human health that generally increases over time, Proposition 65 assumes a lifetime exposure at the level of chemical concentration in the relevant environmental medium (such as air or water). For reproductive toxicants, which may pose an acute risk dependent on the amount of a single dose, Proposition 65 assumes an exposure at one thousand (1,000) times the actual exposure level. These conservative statutory assumptions assure that discharges or exposures are assessed in a preventative manner, in effect taking into account—albeit in an approximate fashion—the cumulative effect of the different sources of toxic chemicals to which persons will be exposed.

a. Risk Assessment For Carcinogens: The No Significant Risk Standard and the Assumption of Lifetime Exposure

Proposition 65 defines a "de minimis" exposure or discharge as one presenting "no significant risk." The regulations define the "no significant risk level" ("NSRL") as "one excess case of cancer in an exposed population of 100,000," assuming a 70-year

37. By assessing liability based on risk assessment rather than actual injury, Proposition 65 distinguishes itself from common law tort. See infra note 265.
38. CAL. HEALTH & SAFETY CODE § 25,249.10(c) (West 2000).
39. Id.
40. See Roe, supra note 30; infra notes 66-71 and accompanying discussion, regarding the different ways these conservative assumptions are implemented under the warning requirement and the discharge prohibition.
41. The one in 100,000 risk factor for carcinogens was adopted in 1988 by OEHHA's predecessor, the Health and Welfare Agency, as a compromise between business and public health interest groups. See Rechtschaffen, supra note 34, at 309. The factor was not as stringent as federal risk assessment guidelines in effect at that time, and has since been superseded by the one in one million risk factor employed by federal and state agencies under a number of statutes. See, e.g., Regulation of Pesticides in Food: Addressing the Delaney Paradox Policy Statement, 53 Fed. Reg. 41104 (1988) (EPA's de minimis policy for carcinogens adopts a one in one million standard); 42 U.S.C. §§ 7412(f)(2)(A), 7412(c)(9)(B)(I) (1994) (regulating hazardous air pollutants under Clean Air Act); Water Quality Standards, 63 Fed. Reg.
lifetime exposure at the level in question." The regulations define "lifetime exposure" as the "reasonably anticipated rate of exposure for an individual to a given medium of exposure measured over a lifetime of seventy years." Thus, the appropriate "daily" exposure level is determined by multiplying the listed chemical concentration in the environmental medium of exposure (typically air or water) by an individual's anticipated daily rate of exposure to that medium.

A defendant may challenge the regulatory assumptions regarding a person's daily exposure to a given environmental medium but not the statutory assumption of lifetime exposure to the measured chemical concentration contained within the medium. This assumption of lifetime exposure means that, although in some cases an individual will almost certainly not be exposed to the same release or discharge over an extended period of time,

16.182, 16,184 (1998) (adopting one in one million standard for assessing risk of PCBs under Clean Water Act); California State Water Board Enclosed Bays and Estuaries Plan, approved November 6, 1991; OEHHA, Public Health Goals (PHGs) for Chemicals in Drinking Water; Health Risk Information for Public Health Goal Exceedance Reports, June 10, 1998. EPA regulation under the 1996 Food Quality and Protection Act also adopts the one in one million standard for carcinogens. See infra note 128.

42. CAL. CODE REGS. tit. 22, § 12703(b) (2001). The regulations define the "level in question" as "the chemical concentration of a listed chemical for the exposure in question." CAL. CODE REGS. tit. 22, § 12721(a) (2001).

43. CAL. CODE REGS. tit. 22, § 12721(b) (2001) (emphasis added). This language clarifies that the "reasonably anticipated rate of exposure" over the course of a lifetime refers to a person's general exposure to the environmental medium in question (such as air or water) and not to the reasonably anticipated rate of exposure to the particular contaminant level in question.

44. CAL. CODE REGS. tit. 22, § 12721(c) (2001). An individual is assumed, for example, to ingest two liters of water per day. CAL. CODE REGS. tit. 22, § 12721(d)(1)(A) (2001). Thus, under the regulations, if an individual were exposed to a given contaminant at a concentration level of 5 micrograms per liter, the daily exposure would be 10 micrograms per day. The regulations also set anticipated daily rates of exposure from air (20 cubic meters per day), CAL. CODE REGS. tit. 22, § 12721(d)(1)(B) (2001), but leave daily exposure rates to other media—such as wine—up to the fact finder. For consumer products, the regulations assume an anticipated rate of exposure based on the average user of the consumer product. CAL. CODE REGS. tit. 22, § 12721(d)(4) (2001).


46. Many commentators have criticized the idea that Proposition 65 would allow for the "averaging" of exposures to environmental media without also averaging concentrations of carcinogens in such media, where the concentrations could reasonably be expected to decline or fluctuate over time. See, e.g., NOSSAMAN ET AL., NAVIGATING PROPOSITION 65 IN THE 1990s: A GUIDE TO THE SAFE PASSAGE THROUGH THE SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 134-35 (1993). This critique ignores, however, the language of the Statute and its purpose of protecting public health and safety through a preventative approach that assumes a lifetime exposure to the "level in question." CAL. HEALTH & SAFETY CODE § 25,249.10(c) (West 2000). See infra notes 348-350 and accompanying discussion.
Proposition 65 will still apply long term risk assessment in establishing liability.\footnote{47}

While this statutory intent seems clear enough, the ultimate parameters of the "lifetime exposure" assumption remain unsettled.\footnote{48} The Statute does not provide guidance, for example, on how a court should treat a momentary "exposure" to a listed carcinogen—diesel exhaust from a passing car's tailpipe, for example—or intermittent exposures that occur on an annual or biannual basis but are well above the regulatory no significant risk level for daily exposures. The regulations vary the calculation of lifetime exposure for consumer product and occupational exposures,\footnote{49} but do not otherwise address the averaging question.\footnote{50} As a practical compromise, the Attorney General's Office has unofficially adopted a one-year average to calculate daily exposure in most instances.\footnote{51} Shorter "averaging" periods, however, could be justified by the literal language of the Statute and the regulations.\footnote{52}

\footnote{47} Thus, for example, even for carcinogenic exposures of limited durations, such as releases from a child's toy product, or emissions from a year-long construction or resource extraction project, the statutory lifetime exposure assumption would still mandate risk assessment based on a 70-year exposure.

\footnote{48} The Proposition 65 regulations are also vague on whether exposure to an environmental medium such as air or water is directly correlated with exposure to the listed chemical. The regulations allow a defendant to introduce "more specific" data regarding an individual's anticipated "rate of exposure," which may overcome regulatory assumptions. \textit{CAL. CODE REGS. tit. 22, § 12721(d)} (2001). The regulations are unclear, however, whether this provision would allow a defendant to argue, for example, that indoor air is distinct from the outdoor air, or that an exposure should be reduced by the \textit{actual} amount of chemical contaminant that poses a risk, such as the percentage of fine particulate that actually reaches the inner portions of the lung where cancer may occur. The statutory "lifetime exposure" assumption would appear to preclude these types of exposure reductions.

\footnote{49} \textit{CAL. CODE REGS. tit. 22, § 12721(d)(3)} (2001) (lifetime "occupational" exposure based on 40 year period multiplied by average work week); \textit{CAL. CODE REGS. tit. 22, § 12721(d)(4)} (2001) (lifetime "consumer product" exposure based on average rate of exposure for average user of consumer product). One way to reconcile these regulatory assumptions with the statutory 70-year lifetime exposure assumption is to consider workplaces and consumer products as "media of exposure," for which such averaging is permitted.

\footnote{50} The Final Statement of Reasons rejects the notion of a 70-year averaging of the concentration "level in question" of a listed carcinogenic chemical. See Final Statement of Reasons for \textit{CAL. CODE REGS. tit. 22, § 12721, at 62}.

\footnote{51} Attorney General Ed Weil, personal communication (October 9, 2001).

\footnote{52} \textit{See infra} notes 348-350 and accompanying discussion regarding the practical effects of conservative risk assessment assumptions in furthering Proposition 65's goal of protecting public health.
b. Risk Assessment For Reproductive Toxicants: The No Observable Effect Level and 1,000-Fold Safety Factor

Proposition 65 defines a "de minimis" discharge or exposure level for reproductive toxicants as one producing "no observable effect assuming exposure at 1,000 times the level in question." The statutory 1,000-fold safety factor is a conservative hedge, applied to account for the uncertain risk that arises when one is exposed to a reproductive toxicant, even for short duration. While the use of safety factors in assessing risks from toxic chemicals with complex modes of action—characteristic of reproductive toxicants—is not unusual, the 1,000 fold factor is far more stringent than other risk assessment statutes and has been criticized as unnecessarily conservative. This criticism, however, misses the larger point that the effects of reproductive toxicants are poorly understood and may pose synergistic threats to human health—threats that Proposition 65 is committed to combat.

Proposition 65's risk assessment regulations for exposures to reproductive toxicants differ from those for carcinogens in an

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53. CAL. HEALTH & SAFETY CODE § 25,249.10(c) (West 2000). The no observable effect level (NOEL) is defined as "the maximum dose level at which a chemical has no observable reproductive effect," expressed in milligrams of chemical per kilogram of body weight per day. CAL. CODE REGS. tit. 22, §§ 12801(c), 12803(a)(1) (2001). See infra notes 256-257 and accompanying discussion of what constitutes a "reproductive effect" in listing a chemical as a reproductive toxicant and in setting the NOEL level. The regulations add that, where available data do not allow a determination of a NOEL, the lowest observable effect level (LOEL) shall be divided by 10 to establish a NOEL for purposes of assessment. CAL. CODE REGS., tit. 22, § 12803(a)(7) (2001).

54. The 1,000-fold safety factor may be considered as a product of three separate factors. First, a 10-fold factor accounts for the difference between animal test data and potential effects on humans. Second, an additional 10-fold factor accounts for the different sensitivities among individuals. Finally, a third 10-fold "uncertainty" factor accounts for the general lack of knowledge and data on the effects and mode of operation of reproductively toxic chemicals.


56. See infra note 106. Some commentators have suggested replacing the automatic 1000-fold safety factor with a similarly protective presumption, which could be overcome by companies based on valid scientific evidence. See Rick Lovett & Roger Carrick, Easy Fix Possible for 1,000-Fold Safety Factor Problems, 11 PROP 65 NEWS, Oct. 1997, at 3. The 1996 Food Quality and Protection Act has adopted a presumptive 1000-fold safety factor when there is incomplete data on the effects and exposures of developmental toxins on infants and children, which the EPA may reduce on a case by case basis. See 21 U.S.C. § 346a(b)(2)(C)(ii) (1996).
important respect. As discussed, exposures to reproductive toxicants may pose acute, as opposed to chronic, risks. To protect against such acute risks, the Statute imposes a high margin of safety for the single exposure, but does not assume a long term exposure to the environmental medium containing the listed reproductive toxicant. Instead, the regulations allow for the averaging of the "exposure level" to a reproductive toxicant over a time period that is relevant to the reproductive effect in question.\textsuperscript{57} Thus, for reproductive toxicants with longer term, chronic exposure risks, Proposition 65 may permit some averaging of contaminant concentrations over time.\textsuperscript{58}

2. Protection of Drinking Water Sources under Proposition 65's Discharge Prohibition

The discharge prohibition of Proposition 65 also adopts a preventative approach to protecting California's drinking water.\textsuperscript{59} Assuming the discharge is not otherwise unlawful,\textsuperscript{60} liability depends on whether a defendant has discharged a "significant amount" of a listed chemical into a "source of drinking water."\textsuperscript{61}

\textbf{a. Defining the "Significant Amount" Standard: Treating a Discharge Like an Exposure}

Proposition 65's risk assessment provisions for listed carcinogens and reproductive toxicants define a "significant

\begin{itemize}
  \item 57. \textit{CAL. CODE REGS. tit. 22. § 12821(b) (2001).} For example, an exposure of short duration would be a relevant measurement for a chemical that causes birth defects, whereas longer exposure periods might be used for a chemical that retards fetal growth, or adversely affects healthy development of reproductive functions among individuals.
  \item 58. The Attorney General has adopted a general presumption that the appropriate period for averaging the concentration levels of reproductive toxicants is 24 hours. Well, personal communication, \textit{supra} note 51. The AG's approach is based on Proposition 65's policy of placing the burden of uncertainty on business and on the Statute's preventative mandate, interpreted in light of the overall lack of knowledge regarding the mode of action for many reproductively toxic chemicals. Under the regulations, a business would have the right to overcome the 24-hour averaging presumption.
  \item 59. For the discharge prohibition text, see \textit{infra} note 9; \textit{CAL. HEALTH & SAFETY CODE} § 25,249.5 (West 2000).
  \item 60. \textit{See infra} notes 79-209 and accompanying discussion regarding the laws applicable to pesticide manufacturers and users.
  \item 61. As discussed above, a defendant's discharge will be exempt from liability only if it can show that 1) the discharge "will not cause any significant amount of the discharged or released chemical to enter any source of drinking water;" and 2) the discharge complies with all other laws and applicable permits. \textit{CAL. HEALTH & SAFETY CODE} § 25,249.9(b) (West 2000) (emphasis added).
\end{itemize}
amount" of discharge as "any detectable amount" except an amount which would meet the exemption test in subdivision (c) of Section 25249.10: "if an individual were exposed to such an amount in drinking water." Thus, through these statutory provisions, Proposition 65 regulates discharges that "enter any source of drinking water" as if the discharge were to be consumed by an individual in drinking water. As a result, discharges into a source of drinking water under Proposition 65 are evaluated under the same risk analysis provisions applicable to exposures.

While the discharge prohibition and the warning requirement share similar risk assessment standards, they differ in several important respects. First, the discharge prohibition does not permit the release of a significant amount of toxic pollution, whether or not a warning is provided. Second, the discharge prohibition does not require actual proof of an exposure. Instead, the Statute recognizes that many potential sources of contamination ultimately affect drinking water quality and thus regulates discharges of contaminants at the source, where they "enter any source of drinking water." This conservative approach is necessary to prevent contamination of what the

62. As discussed in notes 18-28, supra, plaintiffs have the burden of establishing the existence of a "detectable amount" of discharge according to an approved method of analysis. CAL. CODE REGS. tit. 22, § 12901 (2001).
63. CAL. HEALTH & SAFETY CODE § 25,249.11(c) (West 2000) (emphasis added).
64. The three statutory provisions are CAL. HEALTH & SAFETY CODE §§ 25,249.9(b)(1) (West 2000) (exemption provision), 25249.11(c) (definition of "significant amount"), and 25249.10(c) (risk assessment).
65. In other words, in defining a "significant amount", CAL. HEALTH & SAFETY CODE 25,249.11(c) assumes, hypothetically, that an individual has been "exposed" to the "amount" discharged into a source of drinking water, and then incorporates the risk analysis specified in § 25249.10(c).
66. The discharge prohibition is similar in some ways to the "total maximum daily loads" ("TMDLs") that states are required to establish to meet their water quality standards under the federal Clean Water Act. See 33 U.S.C. § 1313(d) (1994). Pursuant to this requirement, States must allocate the TMDL for each pollutant among the different point and non-point source dischargers. See infra notes 205-209 and accompanying discussion.
67. CAL. HEALTH & SAFETY CODE § 25,249.9(b)(1) (West 2000). Thus, a defendant may be in violation of the discharge prohibition even if it can show that the ultimate "exposure" to any individual is well below the significant amount level, if detectable at all. The language of the discharge prohibition itself further supports this interpretation by prohibiting significant discharges "onto land, where such chemical . . . will probably pass into any source of drinking water," thus implicitly supporting the modeling of surface runoff without necessarily requiring measurement of the actual discharged amount. See infra notes 321-328 and accompanying discussion.
Supreme Court characterized as the "broad zone of protection" for drinking water sources. 68

In addition, the two provisions differ in how they calculate risk. Consider a company discharging 10 liters over a 24 hour period with an average chemical concentration of 5 micrograms per liter. Under a normal "exposure" analysis, the appropriate risk level is determined by multiplying the chemical concentration in the water times an individual's anticipated daily rate of water intake, which is two liters under the regulations. 69

Thus, if an individual were exposed to the chemical at a concentration level of 5 micrograms per liter, the amount of daily exposure would be 10 micrograms per day.

The discharge prohibition differs from the analysis set forth above by simply prohibiting the discharge into a source of drinking water of any amount of a listed toxic chemical that would exceed the statutory risk assessment level. 70 Since the risk assessment levels are set forth as daily exposure amounts, the key measurement for purposes of evaluating liability is the amount of chemical discharged into a source of drinking water over a 24 hour period. In this case, the amount of discharge under the discharge prohibition would be 50 micrograms, the result of 10 liters containing 5 micrograms per liter, not the 10 micrograms resulting from the typical exposure analysis, as described above.

Proposition 65 assumes that an individual will be exposed to the entire amount of toxic discharge, irrespective of the chemical concentration in the water and notwithstanding the regulatory assumption that an individual ingests two liters of water per day. By focusing on the amount of toxic discharge rather than a concentration level, "Proposition 65 precludes a defendant from escaping liability by diluting the chemical concentration of its discharge." 71 Through this preventative approach to protecting...

70. See Cal. Health & Safety Code § 25249.11(c) (2001). In other words, in contrast to typical exposure risk assessment, which assumes a "level" of contaminant concentration in an environmental medium, then analyzes an individual's exposure to that medium, the discharge prohibition simply evaluates the "amount" of toxic chemical that has been discharged into a source of drinking water.
71. The discharge prohibition precludes the dilution of contaminant waste streams by applying risk assessment to the amount of discharged chemical...
drinking water, the discharge prohibition offers a potent weapon in combating non-point source surface and ground water pollution caused by pesticides.

b. Interpreting “Source of Drinking Water”

Proposition 65 defines “source of drinking water” expansively, as “either a present source of drinking water or water which is identified or designated in a water quality control plan adopted by a regional board as being suitable for domestic or municipal uses.” The California Supreme Court endorsed a broad reading of this statutory language in 1996, holding that the Act creates “a broad zone of protection for drinking water before it comes out of the tap, outlawing all toxic discharges that will have the probable consequences of contaminating” the water supply and delivery system, from the “mountain stream to the faucet.”

The expansive interpretation of a “source of drinking water,” coupled with Proposition 65’s conservative risk assessment for discharges, creates in the discharge prohibition a formidable enforcement tool with the potential to displace the intricate statutory and regulatory framework that comprises state regulation of water quality. Perhaps fearing this result, the State Water Resources Control Board (“SWRCB”) has several times proposed a “Point of Application” policy that establishes “mixing contamination, rather than to a hypothetical “level” of contamination that could be lowered by simply adding clean water to the waste stream.

72. CAL. HEALTH & SAFETY CODE § 25,249.11(d) (West 2000). In 1988 the State Water Resources Control Board (“SWRCB”) adopted a policy that “all surface and ground waters of the State,” should be so designated, subject to several limited exceptions. See State Water Resources Control Board Resolution No. 88-63, Adoption of Policy Entitled “Sources of Drinking Water,” May 19, 1988. The exceptions are 1) for surface and ground waters that a) have high amounts of total dissolved solids: b) have high levels of difficult-to-remediate contamination; or c) do not provide a sustained yield of 200 gallons per day; 2) for surface waters a) in systems designed to collect or treat wastewater or storm water runoff; or b) in systems designed to convey or hold agricultural drainage waters; and 3) ground waters that are regulated as geothermal energy producing sources or as underground injection wells. Id.

73. American Standard, 14 Cal.4th at 303, 307. The Court observed that “one of the predominant purposes of the Act . . . was to protect drinking water from toxic contamination.” Id. The Court also held that water within the water distribution system—including the household plumbing system—constituted a “source of drinking water” under the Statute. Id. The decision resolved whether plumbing components containing and leaching lead fell within the scope of Proposition 65 and has resulted in a transition within the plumbing industry from leaded brass to unleaded products. See Cliff Rechtschaffen, How to Reduce Lead Exposures With One Simple Statute: The Experience of Proposition 65, 29 ENVTL. L. REP. 10,581 (1999).
zones" for inland surface waters and estuaries. Mixing zones are not considered sources of drinking water for purposes of regional water plans and thus are not subject to otherwise applicable waste discharge standards. The question of whether a mixing zone would immunize a discharger of toxic pollutants from Proposition 65 is, however, a complicated matter. Arguably, the Statute allows the state to designate whole bodies of water as something other than a "source of drinking water." The division of a connected water body into drinking water "sources" and "non-sources," however, defeats the purposes of the Statute by allowing for the very dilution forbidden by the discharge prohibition in the first place.

II OVERVIEW OF PESTICIDE REGULATION

The sale, labeling and use of pesticide products are currently regulated primarily under the Federal Insecticide, Fungicide and Rodenticide Act ("FIFRA"), which requires all pesticides to be


75. The Point of Application Policy states that "a mixing zone shall not be considered a source of drinking water because all water quality standards established to protect human health may not be met in a mixing zone." (emphasis added). Point of Application Policy, supra note 74, at 74.

76. See CAL. HEALTH & SAFETY CODE § 25,249.11(d) (West 2000) (incorporating SWRCB's designation of water bodies into the statutory definition of "source of drinking water").

77. See supra notes 70-71 and accompanying discussion; infra notes 349-350 and accompanying discussion. Such an artificial regulatory division by the SWRCB would further conflict with the will of the voters, who found that "state government agencies have failed to provide them with adequate protection" from toxic chemicals. Initiative Measure, Proposition 65, Section 1 Nov. 4, 1986; see also Preliminary Comments by Environmental Defense Fund and Natural Resources Defense Council on "Mixing Zone" Elements of Draft "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California," Before the State Water Resources Control Board 2 (1997) (arguing that the SWRCB is without legal authority to exclude portions of a continuous water body from the definition of "source of drinking water" for Proposition 65 purposes).
registered with the federal government prior to use.\textsuperscript{78} The State of California implements its own pesticide registration and regulatory program under the authority of FIFRA and the State Constitution. Several other federal and state environmental laws indirectly address pesticide pollution. This section provides an overview of the current regulatory regime and its continuing ineffective control of pesticide pollution.

A. Federal Regulation of Pesticides

1. Background on FIFRA

Federal regulation of pesticides dates back to the Insecticide Act of 1910, the precursor to the 1947 enactment of FIFRA.\textsuperscript{79} These early federal laws required pesticides to be registered, but were primarily intended to protect farmers from ineffective products through enforceable labeling standards.\textsuperscript{80} During the 1960s, the publication of Rachel Carson's Silent Spring, combined with the mounting scientific evidence that indiscriminate pesticide use damaged the environment, resulted in strong public pressure to reform the nation's pesticide laws.\textsuperscript{81} Congress responded in 1972 by passing the Federal Environmental Pesticide Control Act, which amended FIFRA by conferring additional authority on the newly formed federal Environmental Protection Agency ("EPA") to regulate pesticides.\textsuperscript{82}

\textsuperscript{78} In addition, the Federal Food, Drug, and Cosmetic Act (FDCA) establishes permissible tolerances of pesticide residues on food products. See 21 U.S.C. § 346a (1996).


\textsuperscript{80} Under the 1947 law, for example, the Department of Agriculture did not possess the authority to refuse registration even to a pesticide it considered unreasonably dangerous. See Marshall L. Miller, Federal Regulation of Pesticides, in ENVIRONMENTAL LAW HANDBOOK 284, 284-301 (Thomas F. P. Sullivan ed., 14th ed. 1997). For a good description of the origins and history of FIFRA, see CHRISTOPHER J. BOSSO, PESTICIDES & POLITICS: THE LIFE CYCLE OF A PUBLIC ISSUE (1987).

\textsuperscript{81} The passage of the 1972 FIFRA amendments was due in part to the injuries caused to wildlife by the organochlorine insecticide dichlorodiphenyltrichloroethane, otherwise known as DDT. See BOSSO, supra note 80, at 109-77 (describing the rise of environmental opposition to uncontrolled pesticide use).

\textsuperscript{82} See Federal Environmental Pesticide Control Act, Pub. L. No. 92-516, 86 Stat. 975 (codified as amended at 7 U.S.C. § 136 et. seq. (1994)). The EPA was created by Executive order in 1970. The transfer of regulatory jurisdiction over pesticide use from the Department of Agriculture to the EPA reflected a fundamental policy shift towards the regulation of pesticides based on their environmental impacts, rather than simply their ability to control agricultural pests. See BOSSO,
Chief among EPA's responsibilities was to permit only the proposed or continued registration of pesticides\textsuperscript{83} that, "when used in accordance with widespread and commonly recognized practice, . . . will not generally cause unreasonable adverse effects on the environment." \textsuperscript{84}

Under FIFRA, EPA evaluates whether a potential adverse effect is "unreasonable" by balancing the "economic, social, and environmental costs and benefits" of the proposed registration.\textsuperscript{85} To conduct this evaluation, FIFRA requires an applicant to submit testing data relating to a pesticide's effectiveness, toxicity and environmental fate.\textsuperscript{86} A pesticide use may be classified as "general" or "restricted," according to the toxicological and exposure risks presented.\textsuperscript{87} If additional information is uncovered indicating that a pesticide may pose "unreasonable" adverse effects on the environment, EPA may restrict or even

\textsuperscript{83} Pesticides are defined as "any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest . . . intended for use as a plant regulator, defoliant or desiccant . . . and any nitrogen stabilizer . . ." 7 U.S.C. § 136(u) (1994).

\textsuperscript{84} 7 U.S.C. § 136a(c)(5)(D) (1994). FIFRA defines "environment" as including "water, air, land, and all plants and man and other animals living therein, and the interrelationships which exist among these." 7 U.S.C. § 136(j) (1994). The "unreasonable risk" standard has been described as "an undefined, nonzero level of risk determined on an ad hoc basis by balancing both health considerations and nonhealth concerns such as technology, feasibility, and cost." John Applegate, \textit{The Perils of Unreasonable Risk: Information, Regulatory Policy and Toxic Substances Control}, 91 Colum. L. Rev. 261, 268 (1991).


\textsuperscript{86} See 7 U.S.C. § 136a(c)(2) (1994); 40 C.F.R. § 159 (2000). 7 U.S.C. § 136a(d) (1994). In making its determination, EPA evaluates individual uses of a pesticide. Thus, a pesticide may be considered "general use" for some applications, but "restricted use" for others. 7 U.S.C. § 136a(d)(1) (1994). In practice, EPA does not classify pesticides except to restrict their use. Thus, "general use" pesticides are considered to be unclassified. See 40 C.F.R. § 152.160(a) (2000). EPA may restrict pesticides to use only by a qualified applicator, or restrict a product's composition, labeling, packaging, uses, or distribution and sale. 40 C.F.R. § 152.160(b).
cancel the registration. FIFRA also confers upon EPA authority to levy fines for a variety of labeling and use violations.

2. The 1996 Food Quality and Protection Act

In recognition of growing concern regarding food quality, Congress strengthened FIFRA's application to pesticide residues with the enactment of the Food Quality and Protection Act ("FQPA"). This statute established a new health-based safety standard for pesticide residues on food products. Under FQPA, allowable "tolerances" of pesticide residues are established to ensure to a "reasonable certainty that no harm will result" from dietary and other aggregate exposures for which there is reliable information. FQPA pays particular attention to the effects of pesticide residues in the diets of infants and children, requiring EPA to consider the consumption patterns and special sensitivities of this subpopulation when establishing the appropriate "safe" tolerance standard. These tolerance levels


91. 21 U.S.C. § 346a(b)(2)(C) (1996). Under FQPA, the EPA must consider "available information" on the cumulative effects of pesticides with common mechanisms of toxicity from all non-occupational routes of exposure. 21 U.S.C. § 346a(b)(2)(D)(iv-vi) (1996). The EPA approach to cumulative exposures is called the "risk cup." According to the EPA, "as long as the cup is not full . . . EPA can consider registering additional uses and setting new tolerances. If . . . the risk cup is full or
must then be incorporated into FIFRA's reregistration process on a phased schedule to be completed by 2006.\textsuperscript{92}

Under FIFRA, the exceedance of allowable "tolerances" established under FQPA constitutes an "unreasonable effect on the environment" justifying the cancellation of a pesticide's registration.\textsuperscript{93} Thus, FQPA may over time have a significant impact on whether pesticides that leave chemical residues on food products continue to be registered under FIFRA.\textsuperscript{94} Whether FQPA ultimately transforms FIFRA into a health-based, protective regulatory statute, however, is another question. The following sections discuss several factors that continue to undermine FIFRA's ability to control pesticide pollution.

3. Evaluation of Federal Regulation of Pesticides under FIFRA: Limits of a Licensing Statute Based on Risk Assessment

In the 1970s, the EPA used FIFRA's unreasonable risk standard to force the cancellation of a number of the most exceeded, no new uses could be approved until the risk level is lowered." U.S. ENVIRONMENTAL PROTECTION AGENCY. 1996 FOOD QUALITY PROTECTION ACT IMPLEMENTATION PLAN 14 (1997). The EPA must also consider information relating to the endocrine disrupting effects of certain pesticides, a toxicity endpoint never before addressed by any federal statute. 21 U.S.C. § 346a(b)(2)(D)(viii) (1996). FQPA requires the EPA to set up an endocrine screening program under which the possibility of endocrine disrupting effects is tested for each pesticide according to a phased schedule. 21 U.S.C. § 346a(p) (1996). Whether this program will be successfully implemented, however, is still questionable. See, e.g., Davis Balz, Implementing FQPA: U.S. EPA and Endocrine Disruptors, 9 GLOBAL PESTICIDE CAMPAIGNER 6 (1999). Where insufficient data exist to determine whether the impact of a reproductive and/or developmental toxin on children or infants is "safe," EPA must add up to an additional ten-fold safety factor to the tolerance level. 21 U.S.C. § 346a(b)(2)(C)(ii)(II) (1996). FQPA also requires EPA to make an assessment of the "validity, completeness and reliability" of existing data. 21 U.S.C. § 346a(b)(2)(D)(I) (1996).

92. EPA has already missed its first deadline—August 1999—to establish revised tolerances and accompanying registration revisions for the "riskiest" food residue pesticides. See Peter Eisler, Toughest Decisions Still to Come in Pesticide Review, USA TODAY, Aug. 30, 1999, at 1A. This failure has been challenged by a coalition of environmental and labor groups. See Complaint, Natural Resources Defense Council et. al. v. Browner (N.D. Cal. 1990) (No. 99-70946).


94. Under the authority of FQPA, for example, the EPA has instigated a comprehensive tolerance assessment of the organophosphate pesticides, which EPA considers to be the highest priority for re-review. See Pesticide Registration Performance Measures and Goals, 65 Fed. Reg. 37,375, 37,377 (2000); EPA, Office of Pesticide Programs, Status Summary of the Organophosphate Review Process, Feb. 1, 2000, at www.epa.gov/pesticides/op/status.htm. Pursuant to this assessment, EPA sought and negotiated with the registrant a two-year voluntary cancellation of the pesticide chlorpyrifos for household use. See infra note 132. Chlorpyrifos is an insecticide commonly sold under the trade names Lorsban or Dursban. It is found in hundreds of household products.
harmful organochlorine pesticides, such as DDT, aldrin and dieldrin. These regulatory victories were achieved through a combination of agency commitment, lingering public outrage over the environmental harm caused by these persistent toxic chemicals, and the perceived availability of less harmful alternatives. Since that time, however, several factors have conspired to slow FIFRA’s performance in protecting the human and natural environment from pesticide exposures.

a. Limits of Cost Benefit Analysis under FIFRA

A significant historical factor limiting FIFRA’s success in protecting public health and the environment is the cost-benefit analysis built into the statutory “unreasonable risk” standard. Amendments requiring the EPA to consider the impacts of any proposed pesticide restrictions on retail food prices and the agricultural economy emphasize this cost benefit balancing. More than any of the other major federal environmental statutes passed between 1969 and 1973, FIFRA considers the costs to industry and the economy at large of proposed regulatory

95. See Bosso, supra note 80, at 154-58, 194-97.


97. See 7 U.S.C. § 136d(b) (1994) (originally enacted November 28, 1975, 89 Stat. 751) (EPA shall consider the impact of any proposed pesticide cancellation “on production and prices of agricultural commodities, retail food prices, and otherwise on the agricultural economy.”); see also 40 C.F.R. § 154.1 (2000) (no denial of registration or cancellation if pesticide risks can be reduced to acceptable levels or if benefits of pesticides outweigh risks). The 1975 amendments also require the EPA to submit an “agricultural impact statement” to the Department of Agriculture regarding any proposed restriction and provide the Agricultural Secretary an opportunity to comment on the proposed restriction. 7 U.S.C. § 136d(b) (1994). In adding this requirement, the Senate Agricultural and Forestry Committee noted that:

Because the basic thrust and principal responsibility of EPA are to protect the environment, the Committee does not see a need to broaden the impact statement to include the environment. There is clearly a need to consider the impact of EPA’s decisions on agriculture if balance is to be achieved.

S. REP. NO. 94-452, at 9 (reprinted in Merrell v. Thomas, 807 F.2d 776, 780 (9th Cir. 1986)). The 1975 amendments are generally considered to be a congressional reaction to the aggressive enforcement actions taken by the EPA in the early 1970s against the organochlorine pesticides. See, e.g., Bosso, supra note 80, at 195-97; Donald T. Hornstein, The Medicare DRGs: Lessons from Federal Pesticide Regulation on the Paradigms and Politics of Environmental Law Reform, 10 YALE J. ON REG. 369, 434-35 (1993).
restrictions. As a result, many pesticides with known adverse environmental impacts continue to be registered and used in agricultural applications. While FQPA adopts a tougher stance regarding food residue pesticides, it is still unclear whether FQPA's health-based standards will ultimately limit the use of toxic pesticides under FIFRA.

b. Limits of Quantitative Risk Assessment under FIFRA

The blame for FIFRA's ineffectual regulation can also be traced to the inherent limitations of the quantitative risk assessment process, and how it functions under FIFRA. For the EPA, the "hard science" of risk analysis has proven irresistible, both as a tool to guide pesticide regulation and as a


99. See, e.g., Memorandum from James J. Jones, Office of Pesticide Programs, U.S. EPA, to Jerome R. Campbell, Supervisor of Regulation, Department of Pesticide Regulation, California Environmental Protection Agency (Apr. 30, 1999) (EPA will allow application of 150,000 pounds of a canceled pesticide based on findings under Section 18 of FIFRA that the is essential to the agricultural economy and to reducing prices for food consumers); see also 40 C.F.R. § 154.1 (2000) (no restrictions where benefits of pesticide outweigh its risks). EPA's cost-benefit balancing under FIFRA resembles the "cost-justified model," in which regulation will only be implemented if the benefits of a regulatory action clearly outweigh the costs. See generally William H. Rodgers, Jr., Benefits, Costs, and Risks: Oversight of Health and Environmental Decisionmaking, 4 HARV. ENVTL. L. REV. 191, 201-14 (1980).

100. FQPA adopts a health-based standard designed to ensure a "reasonable certainty" of no harm. Under FQPA, cost-benefit balancing is limited to pesticides with carcinogenic effects, and then only upon a showing that the imposition of the pure health-based standard would itself pose non-dietary health risks or would cause a "significant disruption in domestic production of an adequate, wholesome, and economical food supply." 21 U.S.C. § 346a(b)(2)(B)(iii) (1996). FQPA limits the extent to which such cost-benefit balancing may reduce FQPA's safety standard to a factor of 10 for yearly risk, and a factor of 2 for lifetime risk. 21 U.S.C. § 346a(b)(2)(B)(iv) (1996). The federal Endangered Species Act and Safe Drinking Water Act also provide for more protective standards, with little or no account taken of cost factors. See infra notes 167-173 and accompanying discussion.

political shield against the partisan battles that surround the determination of national pesticide policy. As many commentators note, however, there are reasons to doubt EPA's faith in the risk assessment process under FIFRA. Pesticide risk assessment is extremely complex and information-intensive. It contains inherent uncertainties. An accurate assessment requires the EPA to assess the toxicity, environmental fate, exposure scenarios and resulting cumulative risks to humans and the natural environment from thousands of pesticide products. These products are themselves composed of both active and "inert" ingredients, many of which break down into toxic metabolites when exposed to sunlight or water. Once released into the environment, different pesticide residues may act cumulatively or even synergistically with one another—or with other substances—in ways still not well understood by


103. See, e.g., John Carlucci, Reforming the Law on Pesticides, 14 VA. ENVTL. L.J. 189 (1994); Pamela A. Finegan, FIFRA Lite: A Regulatory Solution or Part of the Pesticide Problem?, 6 PACE ENVTL. L. REV. 615 (1989); Hornstein, supra note 97, at 438-56; Applegate, supra note 84.

104. The "active ingredient" is that part of the pesticide which causes the physiological harm to the pest or weed. See 7 U.S.C. § 136(a) (1994). Inert ingredients have no pesticidal effect but are used to "dissolve, dilute, deliver or stabilize" active ingredients. 7 U.S.C. § 136(m) (1994); U.S. GENERAL ACCOUNTING OFFICE, PESTICIDES: EPA'S FORMIDABLE TASK TO ASSESS AND REGULATE THEIR RISKS 23 (1986). Despite their characterization as harmless, inert ingredients include such toxic chemicals as benzene and vinyl chloride. See Finegan, supra note 103, at 638 n.199; SANDRA MARQUARDT ET AL., TOXIC SECRETS: "INERT" INGREDIENTS IN PESTICIDES 1987-1997 (1998).

105. See J.L. Domagalski, Abstract, A Synoptic Study of Agricultural Pesticides and Pesticide Degradation Products: Sacramento River Basin, California, National Water Quality Assessment Program, 75 EOS: TRANSACTIONS OF THE AM. GEOPHYSICAL UNION (Supp.) 230 (1994); James J. La Clair, John A. Batté & James Dumont, Photoproducts and Metabolites of a Common Insect Growth Regulator Produce Developmental Deformities in Xenopus, 32 ENVTL. SCI. & TECH. 1453 (1998). For example, the most highly used pesticide in California, metam sodium, breaks down on contact with air or water into several degradate products, the principal of which, methyl isothiocyanate or "MITC," is also considered highly toxic. Studies of the environmental effects of this pesticide, however, routinely fail to distinguish between exposures to metam sodium and MITC. See, e.g., CAL. ENVT'L. PROT. AGENCY DEP'T OF PESTICIDE REGULATION MEDICAL TOXICOLOGY BRANCH, SUMMARY OF TOXICOLOGY DATA METAM-SODIUM (1986).
science. Finally, the adverse effects of pesticide exposures may be latent, manifesting only years later in a given population.

Even in the best circumstances, assessment of such complex and interrelated risk factors would be an overwhelming challenge, requiring enormous resources and years of study. Pesticide regulation under FIFRA, however, has never enjoyed this kind of legislative commitment. Instead, it has operated under severe time pressure and has been constrained by scarce resources from the beginning. The combination of

106. See, e.g., Warren P. Porter, James W. Jaeger & Ian H. Carlson, Endocrine, Immune and Behavioral Effects of Aldicarb (Carbamate), Atrazine (Triazine) and Nitrate (Fertilizer) Mixtures at Groundwater Concentrations, 15 TOXICOLOGY & INDUSTRIAL HEALTH 133 (1999); DAVID WALLINGA, PUTTING CHILDREN FIRST: MAKING PESTICIDE LEVELS IN FOOD SAFER FOR INFANTS & CHILDREN 15-23 (1998); D. Jonker et al., 4-Week Oral Toxicity Study of a Combination of Eight Chemicals in Rats: Comparison With the Toxicity of the Individual Compounds, 28 FOOD CHEM. TOXICOLOGY 623 (1990); M. Ikeda, Multiple Exposure to Chemicals, 8 REG. TOXICOLOGY & PHARMACOLOGY 414-21 (1998).


108. Professor Applegate notes that an inherent difficulty in a licensing statute such as FIFRA is that "the premarket phase of [product] development is the time when the least information is known about a chemical's long-term effects." Applegate, supra note 84, at 312.


110. See id. at 10,072-76; see generally U.S. GENERAL ACCOUNTING OFFICE, supra note 104, at 20-57. The 1972 amendments required EPA to review the registrations of thousands of pesticides to determine their compliance with the unreasonable risk standard under a wholly unrealistic statutory deadline of four to five years. See Federal Environmental Pesticide Control Act, Pub. L. No. 92-516, § 4(c)(2), 86 Stat. 973 (codified as amended at 7 U.S.C. § 135 et. seq. (1972)). In 1971, EPA stated that there were nearly 45,000 outstanding pesticide registrations for "hundreds" of substances in use over approximately five percent of the total land area of the United States. Envtl. Def. Fund v. Envtl. Prot. Agency, 465 F.2d 528, 533-36 (D.C. Cir. 1972). Other sources have estimated the number of pesticide registrations subject to review at the time of the 1972 amendments to have been between 30,000 to 60,000. See Ferguson & Gray, supra note 109, at 10,073. In 1978, Congress extended the deadline for registration review but failed to allocate the necessary funds to complete the task. See Federal Pesticide Act, Pub. L. No. 95-396, § 3(g), 92 Stat. 819 (1978). A decade later, in 1988, impatient with the continued slow pace of reregistration and mindful of growing public concerns over inadequate health and safety data on widely used pesticides, Congress again amended FIFRA to require reregistration of all
congressional deadlines and limited budgets creates a less than optimal environment for EPA to assess pesticide risk, particularly for pesticides subject to the reregistration process. Consider, for example, the generation of data upon which EPA relies to make its "unreasonable risk" determination. Since EPA lacks the resources to conduct its own testing, it must rely on pesticide manufacturers to supply the necessary data. However, besides being extremely expensive, testing offers the possibility of revealing unreasonable risks posed by the tested product. Thus, a strong incentive exists for manufacturers to provide the minimum data required under the regulations and to skew or fail to provide testing results indicating unreasonable risk. While FIFRA allows the EPA to reject inadequate data

pesticides first licensed before November 1, 1984 under a phased schedule to be completed within ten years. See Ferguson & Gray, supra note 109, at 10075. See generally U.S. GENERAL ACCOUNTING OFFICE, supra note 104, at 20-57. A 1984 National Academy of Sciences Report, for example, stated that adequate health and safety data for proper risk assessments existed on only 10 percent of the pesticides in use. NATIONAL ACADEMY OF SCIENCES, TOXICITY TESTING: STRATEGIES TO DETERMINE NEEDS AND PRIORITIES (1984). By 1996, the job still undone, Congress mandated that EPA publish annual reports on its progress in completing the reregistration process. See FIFRA § 4(a), 7 U.S.C. § 136a-1(a) (1996); see also Ferguson & Gray, supra note 109; Finegan, supra note 103. The 1996 amendments to FIFRA also imposed significant additional review obligations on the EPA to comply with new restrictions on pesticide residues in food pursuant to FQPA, again under a tight statutory time schedule on which EPA has already fallen behind. See Food Quality and Protection Act, Pub. L. No. 104-170, 110 Stat. 1489 (codified as amended at 21 U.S.C. §346a (1996)); FIFRA § 4(l), 7 U.S.C. § 136a-1(l) (1996). This section is entitled "Performance measures and goals." The 1996 amendments requiring EPA to report on its progress were partly a response to a 1992 G.A.O. report that noted that "some 20 years after the Congress directed EPA to reregister older pesticides, only 2 of 19,000 older pesticide products have been reregistered." U.S. GENERAL ACCOUNTING OFFICE, PESTICIDES: 30 YEARS SINCE SILENT SPRING-MANY LONG STANDING CONCERNS REMAIN 3-5 (1992). In addition, EPA informed Congress during the FQPA hearings that it would need at least 8 additional years - to 2004 - to complete the 1988 reregistration program, twice the time allotment mandated by the 1988 amendments. See H.R. REP. No. 104-669, pt. 1, 68 (1996).

111. A licensing scheme such as FIFRA creates in effect a two-tiered system, in which older chemicals are likely to be less well-tested than to those registered more recently. Applegate, supra note 84, at 312.

112. FIFRA's risk assessment provisions assume that EPA will review data generated by manufacturers. See 7 U.S.C. § 136a(c) (1994); WALLINGA, supra note 106, at 25.


114. See WALLINGA, supra note 106, at 25; Hornstein, supra note 97, at 436-38 (discussing manipulations of data by pesticide registration applicants); Mary L. Lyndon, Information Economics and Chemical Toxicity: Designing Laws to Produce and Use Data, 87 MICH. L. REV. 1795, 1803-04 (1989). In addition, pesticide manufacturers may refuse to disclose the contents of non-active or "inert" pesticide
submittals and to request additional testing through the data call-in process,\textsuperscript{115} such diligence takes time and resources and eventually generates even more information for EPA staff to review.\textsuperscript{116} Exposure assessment creates a similar dilemma, since monitoring is expensive and time consuming, and detections of pesticide residues in the field trigger additional data requests to registrants, thereby further delaying the reregistration process.\textsuperscript{117} As statutory deadlines approach, EPA may understandably focus on completing registration review at the expense of more comprehensive inquiry.\textsuperscript{118}

Deadlines and tight budgets also create a disincentive for EPA to enlarge, through the rulemaking process, the scope of mandatory data submissions. Additional data are necessary, however, since, under existing regulations, required data regarding a pesticide's residue potential, environmental fate, and toxicity to humans, fish and invertebrate organisms provide at best an incomplete or speculative picture of environmental impacts.\textsuperscript{119} Although scientific understanding of these complex ingredients based on the theory that such chemicals constitute protected "trade secrets." See, e.g., 7 U.S.C. § 136h (1994) ("Protection of trade secrets and other information"); Tybe A. Brett & Jane E.R. Potter, \textit{Risks to Human Health Associated with Exposure to Pesticides at the Time of Application and Role of the Courts}, 1 \textit{Vill. Envtl. L.J.} 355, 358-63 (1990). Many of these ingredients are toxic on their own, or in combination with other chemicals. See, e.g., \textit{Marquardt et al.}, \textit{supra} note 104. 115. 7 U.S.C. §§ 136a(c)(2) (1994) (discussing requesting and submission of data in support of registration), 136a(g)(2) (discussing registration review), 136a-1 (discussing reregistration of registered pesticides).

116. To avoid this type of resource drain, EPA's practice in the 1970s and 1980s was to allow pesticides to be reregistered despite outstanding data gaps. See, e.g., Ferguson & Gray, \textit{supra} note 109, at 10,074; Hornstein, \textit{supra} note 97, at 437. As discussed infra, however, this process creates a problem since any subsequent restrictions on such reregistered pesticides require EPA to undertake the cumbersome special review process. See \textit{infra} notes 141-154 and accompanying discussion. The FIFRA regulations acknowledge the limits of EPA's oversight role by only requiring confirmation that submitted data have been developed according to proper testing methodologies, but not that such data be accurate. See 40 C.F.R. § 158.80 (2000); Brett & Potter, \textit{supra} note 114; Burke v. Dow Chemical, 797 F. Supp. 1128, 1135 (E.D.N.Y. 1992).

117. EPA will often identify additional data needs based on its own exposure analysis. See 40 C.F.R. § 158.101(b) (2000) (data may be designated as conditionally required depending on product's use pattern, physical or chemical properties, expected exposure of non-target organisms and/or results of previous testing).

118. \textit{See} Hornstein, \textit{supra} note 97, at 437 ("[T]he Agency openly worried that the rate at which it rejected industry studies was 'too high' because it would prevent reregistration by the new target date of 1997, or even beyond an extended target of 2002.")

119. The specific federal data requirements relating to environmental impacts are set forth at 40 C.F.R. § 158.202 (2000) and cover residue chemistry (§ 158.202(c)); environmental fate (§ 158.202(d)); hazard to humans and domestic animals (§ 158.202(e)); reentry protection (for workers) (§ 158.202(f)); pesticide spray drift.
mechanisms has grown over the last decades, regulatory amendments to require additional data are years if not decades away.  

The problem with incomplete information is that it produces uncertainty in risk assessments. In many situations, risk that is "uncertain" will not be considered "unreasonable," particularly when compared to the readily quantifiable economic impacts to farmers and consumers resulting from regulation. Even more significantly, uncertainty in risk assessment may substantially hinder regulation when the regulatory agency bears the burden of establishing the "risk" posed by a particular activity. In theory, the burden under FIFRA to establish that a particular pesticide use is safe is borne by the proponent of registration.

evaluation (§ 158.202(g)); hazard to nontarget organisms (§ 158.202(h)); and product performance (§ 158.202(f)). Many potential impacts of pesticide use, including cumulative and/or synergistic effects, endocrine disrupting effects, effects on developing organisms, sublethal effects, and long term effects of toxic byproducts of pesticide breakdown, are not well addressed by these regulatory requirements. See WALLINGA, supra note 106, at 25-40; Porter, supra note 106; La Clair, supra note 105. In this sense, pesticides are one of several sources of ubiquitous chemical contaminants in our physical environment. Cynthia Carey & Corrie J. Bryant, Possible Interrelations Among Environmental Toxicants, Amphibian Development and Decline of Amphibian Populations, 103 ENVTL. HEALTH PERSP. Supp. 4 (1995); Rob Edwards, Sea Sickness: Deaths of Harbour Porpoises Are Linked to PCBs and Mercury, NEW SCIENTIST, Dec. 18, 1999, at 12.


In the face of such uncertainty, a fact finder may well decide against imposing the foreseeable and tangible costs associated with a cancellation or restriction of a pesticide use. In National Coalition Against Misuse of Pesticides v. Environmental Protection Agency, 867 F.2d 636 (D.C. Cir. 1989), the court noted:

[The EPA Administrator] might determine after an administrative hearing (involving the expenditure of substantial administrative resources) that scientific uncertainty as to the danger of a specific pesticide (combined perhaps with the economic impact of cancellation on 'agricultural commodities, retail food prices and [ ] the agricultural economy' [ ]), indicates that the registration should not be cancelled.

Id. at 642 (quoting 7 U.S.C. § 136d(b) (1982)). See also Love v. Thomas, 858 F.2d 1347, 1363 (9th Cir. 1988) (reviewing specific numbers on crop losses in reversing EPA's decision to cancel use of pesticide dinoseb).  

123. See, e.g., Applegate, supra note 84, at 264-67; Latin, supra note 121, at 357-58.

In many respects, however, the mechanics of the registration process place a significant burden on the EPA to establish that a particular use is harmful. If a registrant skews testing results or submits incomplete information on a pesticide product, for example, the EPA must spend time and resources to determine that the data submitted are inadequate. If it fails to do so, EPA's subsequent registration denial, cancellation, or restriction may be overturned on judicial review as unsupported by substantial evidence. EPA also bears the burden of requesting or developing fully the types of information needed to assess a pesticide's impact on human health and the environment, and determining whether pesticide use in the field is causing human or environmental exposures. If time or budget constraints persuade EPA to forgo such inquiries, it will be unable to establish a sufficient factual record to withstand judicial review.

EPA's burden is all the more substantial given that neither FIFRA nor its regulations establish specific standards as to when pesticide residues constitute a significant impact on public health or the environment. Thus, unlike other federal

125. See Envtl. Def. Fund v. Envtl. Prot. Agency, 548 F.2d 998, 1005 (D.C. Cir. 1976); Envtl. Def. Fund, 465 F.2d at 537. Even if substantial evidence is produced, the registrant may introduce its own studies contradicting EPA's results, or highlighting other factors not considered. See, e.g., Nat'l Coalition Against Misuse of Pesticides, 867 F.2d at 642 ("[ou]r cases holding that the Administrator satisfies his burden of proffering 'substantial evidence' of harm from respected scientific sources... [do not] mean that the Administrator is guaranteed victory if the proceedings are contested by the registrant and the ultimate order challenged subsequently in federal court"); Love, 858 F.2d at 1362 (holding that EPA's failure to consider economic impacts justifies reversal notwithstanding evidence of harm).

126. Registrants have no incentive to provide data beyond the minimum regulatory requirements. See WALLINGA, supra note 106, at 25. While FIFRA regulations require an applicant to submit any factual information regarding unreasonable adverse pesticide effects as part of the registration application, 40 C.F.R. § 152.50(f)(3) (2000), and after the pesticide is registered, 7 U.S.C. § 136d(a)(2) (1994); 40 C.F.R. § 159.152 (2000), nothing in FIFRA or its regulations provides any incentive for registrants to develop such information on their own.

127. See 7 U.S.C. § 136r(c) (1994) (granting EPA authority to conduct monitoring in cooperation with other federal, state and local agencies). In cases where high levels of contamination have been detected, EPA has the power to require registrants to submit monitoring and use information as part of the data call-in process. See, e.g., Atrazine, Simazine and Cyanazine, 59 Fed. Reg. 60,412, 60,414 (1994) (describing EPA's 1989 data requests to Ciba Geigy for ground and surface water monitoring information and use data on simazine). EPA has also negotiated with registrants to conduct their own monitoring for some newly registered pesticides. See, e.g., Office of Pesticide Programs, U.S. EPA, Acetochlor Desk Statement (1994), available at http://www.epa.gov/oppefed1/aceto/index.htm (noting that registration of acetochlor would be dependent on registrants continuous ground and surface water monitoring in areas where product will be applied.)

128. The harm-based standards of FQPA, which are incorporated into FIFRA standards, are one exception to this general rule. See 7 U.S.C. § 136(bb) (1994)
regulatory statutes, FIFRA does not allow the EPA to ban or restrict a pesticide use based on violations of a particular emission or exposure standard. Instead, the EPA must support each individual determination with substantial evidence of "unreasonable risk." Where such evidence is lacking or fragmentary, the use may be allowed to continue.

FQPA attempts to remedy these seemingly chronic information gaps by requiring EPA to consider a range of toxicity and exposure data in setting "safe" tolerances for pesticide residues on food products. As a legal matter, the provisions of FQPA provide EPA with tremendous legal authority—indeed, a statutory duty—to conduct more meaningful and informed risk assessment. The results of such in-depth review can be significant. In June, 2000 the EPA negotiated a phase-out for home and garden products containing the ubiquitous organophosphate chlorpyrifos, based on new testing demonstrating that the developing brains of infants could be more sensitive to the chemical's neurotoxic properties. Despite this and other regulatory successes, however, a question (human dietary risk from pesticide residues not in compliance with FQPA constitutes unreasonable impact on the environment). For carcinogenic pesticides, FQPA's harm-based standard has been inferred from Congressional hearings to be EPA's historical "de minimis" standard of one in a million lifetime risk. See H.R. REP. NO. 104-669(ii), at 41 (1996). For pesticides with non-carcinogenic effects, FQPA applies a safety standard of no observable adverse effect, with the normal safety 100-fold factor to account for differences between animals. FQPA requires EPA to apply a tenfold margin of safety unless the EPA can determine "on the basis of reliable data," that a lesser safety factor will be sufficient to ensure protection. 21 U.S.C. § 346a(b)(2)(C)(ii) (1996).

129. See, e.g., Nat'l Coalition Against Misuse of Pesticides, 867 F.2d at 642; 7 U.S.C § 136d(d) (1994) (holding that an EPA order denying, restricting or canceling a registration "shall be based only on substantial evidence... and shall set forth detailed findings of fact upon which the order is based"). FIFRA thus confers broad discretion on the EPA to determine what constitutes an unreasonable impact on the environment, but does not necessarily encourage the agency to exercise that discretion to restrict pesticide use.

130. A good example, among many, is the organophosphate chlorpyrifos, a common household and agricultural insecticide first registered in 1965 and subsequently reregistered in the 1980s. Not until the year 2000, when new test results indicated increased neurotoxic susceptibility among developing infants and children, was the use of chlorpyrifos in home, lawn and garden products phased out by EPA. See infra notes 132, 146 and accompanying discussion.


remains whether the FQPA risk assessment process can translate to a reduction in pesticide exposures to humans.\textsuperscript{133} Due to its focus on food residues, for example, FQPA regulates pesticides posing risks through air, water or soil contamination only on a tangential basis. Moreover, it depends upon the existence of "reliable information," which is often not available.\textsuperscript{134}

Furthermore, FQPA is limited by its ultimate reliance on the risk assessment process for policy direction. FQPA simply adds statutory force to a risk assessment process already beset with uncertainty. The statute attempts to shift the burden of this uncertainty to pesticide manufacturers, but this is a difficult task given the contentious partisan battles that quickly envelop risk assessment debates. Instead, the strong possibility exists that FQPA will succumb to the same historical political tug of war that has so drastically limited pesticide regulation under FIFRA.\textsuperscript{135} Under this scenario, FQPA intensifies, but does not break from the "analytical treadmill" of quantitative risk assessment.\textsuperscript{136} Meanwhile, as discussed below, the larger

\textsuperscript{133} FQPA does not address pesticide environmental impacts that do not directly effect human beings. It seems likely that one perhaps unintended result of FQPA's emphasis on human health and food residues will be the creation, over time, of an even larger gap between what is known of the impacts of pesticides on humans and knowledge of impacts on the non-human physical environment, including wildlife.

\textsuperscript{134} See, e.g., EPA, OFFICE OF PESTICIDE PROGRAMS, PROPOSED GUIDANCE ON CUMULATIVE RISK ASSESSMENT OF PESTICIDE CHEMICALS THAT HAVE A COMMON MECHANISM OF TOXICITY 4 (2000), available at http://www.epa.gov/fedrgstr/EPA-PEST/2000/June/Day-30/6049.pdf ("due to limitations in currently available data and assessment methodologies... the data for residential/non-occupational and drinking water exposures are comparatively less"). Even if such data were available, it is not clear that EPA is prepared to utilize it in meaningful cumulative risk analysis. See EPA, Response to Public Comments on the Preliminary Risk Assessments for the Organophosphate Pesticide Chlorpyrifos-Methyl, Apr. 21, 2000, at 6 ("The Agency acknowledges that it has not yet performed a cumulative risk assessment, because the methodology for conducting such assessments is still being developed.").

\textsuperscript{135} Clearly, the political battle has already been joined. In June 1999, for example, the American Crop Protection Association and the American Farm Bureau Federation, groups representing pesticide manufacturers and users, filed suit claiming that EPA was making policy decisions with insufficient data. Bette Hileman, Reexamining Pesticide Risk, CHEM. & ENG'G NEWS, July 17, 2000, at 34. Around the same time, House and Senate bills were introduced that would have forced EPA to give pesticide manufacturers more time to present data. Id. Meanwhile, environmental and consumer groups sued EPA for failing to move fast enough in conducting risk reassessments and resigned in protest from EPA's Tolerance Reassessment Advisory Committee due to its failure to make meaningful progress on any significant reassessment issue. Id.; supra note 110; William Claborne, 7 Groups Quit Food Panel, WASH. POST, Apr. 28, 1999, at A23; see also Tim Stroshane, U.S. Food Quality Protection Act: Will the Risk Cup Runneth Over?, 9 GLOBAL PESTICIDE CAMPAIGNER, Apr. 1999, at 1; Peter Eisler, Toughest Decisions Still to Come in Pesticide Review, USA TODAY, Aug. 30, 1999, at 1A.

\textsuperscript{136} See Hornstein, supra note 97, at 442-43.
question of whether there may be preferable alternatives to the intensive use of chemicals to control pests remains largely unexplored.\textsuperscript{137}

c. Limits of Enforcement under FIFRA

The range of enforcement options available under FIFRA is inherently limited by its regulatory focus on registration and labeling. Unlike many environmental statutes, for example, FIFRA does not allow for citizen enforcement.\textsuperscript{138} Instead, it confers sole enforcement authority on the EPA and its state agency delegates.\textsuperscript{139} When an unreasonable pesticide impact occurs in the field, the EPA is limited to either initiating special review proceedings to cancel or restrict the pesticide's registration or attempting to cite users for violations of the label directions.\textsuperscript{140} Neither of these options provides for a particularly effective enforcement scheme.

Given the economic interests at stake, it is not surprising that the restriction or cancellation of a pesticide registration is a procedurally complicated and often lengthy matter. The procedural hurdles strewn throughout the administrative review process\textsuperscript{141} require prohibitive amounts of the EPA's time and

\begin{itemize}
  \item \textsuperscript{137} See infra notes 155-163 and accompanying discussion.
  \item \textsuperscript{138} See Fiedler v. Clark, 714 F.2d 77, 79 (9th Cir. 1983) ("legislative history of FIFRA confirms that Congress did not intend to create a private right of action under FIFRA"); Almond Hill School v. United States Dept. of Agriculture, 768 F.2d 1030, 1035-38 (9th Cir. 1985). Nor can citizens challenge registration decisions through the NEPA process. Merrell v. Thomas, 807 F.2d 776, 780-81 (9th Cir. 1986) (holding that registration decisions are exempt from NEPA).
  \item \textsuperscript{139} See 7 U.S.C. § 136w-1 (1994) (granting to states "primary enforcement responsibility").
  \item \textsuperscript{140} See, e.g., Inconsistent Labeling, supra note 89.
  \item \textsuperscript{141} To begin the process, EPA first must privately notify the registrant that it is considering initiating special review based on observed adverse environmental impacts of the pesticide. 40 C.F.R. § 154.21(a) (2000). U.S. ENVIRONMENTAL PROTECTION AGENCY, STATUS OF PESTICIDES IN REGISTRATION, REREGISTRATION, AND SPECIAL REVIEW 11(1998), available at http://www.epa.gov/oppsrrd1/Rainbow/98rainbo.pdf [hereinafter RAINBOW REPORT]. After an informal notice and comment process, EPA then must determine whether to initiate "special review" based on a series of criteria relating to adverse impacts on public health, non-target organisms or endangered species. 40 C.F.R. § 154.7 (2000). EPA may initiate special review upon a showing that a pesticide may cause serious acute or chronic health effects to humans or non-target organisms, or may pose a risk to the continued survival of an endangered species or adversely affect its critical habitat. 40 C.F.R. § 154.7(a)(1) - (6) (2000). If preliminary review indicates that a pesticide is having such "unreasonable" adverse impacts on the environment, EPA must publish a notice of Special Review. 40 C.F.R. § 154.25(c) (2000). This notice is known as a Position Document ("PD") 1. The notice describes the Special Review criterion of concern, the assumptions and data used in the analysis, and the strength
resources and impose a significant burden on EPA to provide factual support for its proposed action.\textsuperscript{142} These hurdles can delay enforcement for years.\textsuperscript{143} During this time a pesticide may continue to be used unless the EPA makes a formal finding that such use constitutes an “imminent hazard” justifying immediate suspension.\textsuperscript{144} Furthermore, even after a final order, the EPA must allow individual states to permit application of a canceled of the conclusions. The notice will also announce the availability of the pre-Special Review public docket, solicit public comment and request additional information on the pesticide. RAINBOW REPORT at 11.

EPA commences special review by meeting with “interested parties” and conducting a risk-benefit analysis. Id. at 12. Potential risks are evaluated by considering such factors as 1) adverse impacts to health or the environment; 2) magnitude of exposure of humans and other non-target organisms; and 3) size of the population at risk. Benefits of use are evaluated by assessing the availability, efficacy and cost of alternative control methods, and impact on users, consumers, and other parties if the pesticide is canceled. Id. As discussed, FIFRA is explicit that EPA consider the impact of any proposed pesticide cancellation or restriction on the agricultural economy and on consumer prices. 7 U.S.C. § 136d(b)(1994); 40 C.F.R. § 154.1 (2000). Where the “benefits” of continued use are found to outweigh the perceived risks, EPA will then publish a Notice of Decision to Terminate the Special Review. This is known as a Position Document 2. RAINBOW REPORT at 12. If risks are perceived to outweigh benefits, and the registrant is unwilling to amend the registration so as to reduce such risks, EPA issues a notice of Preliminary Determination, which initiates a formal round of notice and comment. RAINBOW REPORT at 12. The Notice of Preliminary Determination is known as a PD 2/3. Id.

FIFRA provides a registrant the right to an evidentiary hearing on the merits. 7 U.S.C. § 136d(b) (1994); 40 C.F.R. §§ 154.15 - 154.29 (2000). As part of this process, EPA submits the Preliminary Determination, including an “agricultural impact analysis,” to the Department of Agriculture regarding any proposed restriction, to which the Agricultural Secretary may provide comments. 7 U.S.C. § 136d(b) (1996); 40 C.F.R. § 154.31(b) (2000). The Secretary’s comments must be published in the Federal Register, with appropriate responses by EPA. Id. At the hearing, questions of scientific fact may be referred to an outside body, the FIFRA Scientific Review Panel, whose report thereupon becomes part of the administrative record. 7 U.S.C. § 136d(d) (1996); 40 C.F.R. § 154.31(b) (1994). RAINBOW REPORT at 12. After evaluating all comments, EPA issues a Notice of Final Determination, also known as a Position Document 4, which sets forth the agency’s intention to cancel, deny or reclassify an existing registration. 40 C.F.R. § 154.33 (2000); RAINBOW REPORT at 12. Cancellation or restrictions are subject to judicial review based on the substantial evidence standard. 7 U.S.C. §§ 136d(h), 136n (1994); see Envtl. Def. Fund v. Envtl. Prot. Agency, 465 F.2d 528, 539 (D.C. Cir. 1972); Envtl. Def. Fund v. Envtl. Prot. Agency, 510 F.2d 1292, 1303 (1975).


143. See, e.g., Hornstein, supra note 97, at 437-38 (describing how “informational demands of risk analysis doom the regulatory process to a perpetual state of slow motion”).

144. 7 U.S.C. § 136d(c) (1994).
or restricted use pesticide if there is the possibility of a "significant economic loss."  

This process provides EPA with strong incentives to forgo cancellation or suspension proceedings in favor of less severe sanctions. For example, EPA often negotiates with registrants to place warnings and use restrictions on pesticide labels. Incremental enforcement is encouraged by the language of FIFRA, which requires EPA to consider restrictive labeling as an alternative enforcement option at each stage of the special review process. Restrictive labeling, however, does not necessarily translate to a reduction in risk. FIFRA's labeling provisions create enforceable standards for labeling or use directions, but impose no direct sanctions on manufacturers or users for

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146. See, e.g., Atrazine, Simazine and Cyanazine, Notice of Initiation of Special Review, 59 Fed. Reg. 60,412, 60,415 (1994) (indicating that the first special review of cyanazine resulted in restricted uses and labeling amendments); Alachlor: Notice of Intent to Cancel Registrations; Conclusion of Special Review, 52 Fed. Reg. 49,480 (1987) (indicating EPA's agreement not to cancel pesticide if registrant agrees to comply with use restrictions and label amendments.) Explaining why, after testing showed brain damage to laboratory fetal rats, EPA negotiated a multi-year phaseout rather than implementing an immediate ban on household products containing chlorpyrifos, EPA Administrator Carol Browner noted that "[t]his is the fastest possible action that we could have taken ... If we had been forced to go through the legal process [for a recall or immediate ban] it would have taken ... years." EPA Limits Sales of a Common Pesticide, S.F. CHRON., June 9, 2000, at A12.

147. See 7 U.S.C. § 136d(b) (1994) (requiring EPA, in taking any final action under Special Review process, to consider restricting a pesticide's use as an alternative to cancellation.); see also 40 C.F.R. §§ 154.1 (2000) (allowing formal review procedures to be skipped if "risks can be reduced to acceptable levels"), 154.31(a)(2) (requiring that a Preliminary Determination include a determination of whether "any changes in the composition, packaging, labeling, or restrictions on use of a pesticide product," proposed by a registrant, would "reduce the risk so that the use no longer would satisfy any of the risk criteria" in the FIFRA regulations). In explaining the Special Review process, the RAINBOW REPORT notes that "the ultimate goal of the Special Review process is to reduce the risks posed by a pesticide to an acceptable level while taking into account the benefits provided by the use of that pesticide. RAINBOW REPORT, supra note 141, at 12. In describing "Negotiated Settlements," the report also notes that "[a]t any time in the review process, a registrant may reach an agreement with the Agency to modify the terms and conditions of a pesticide registration." Id.
causing pesticide contamination.\textsuperscript{148} This creates a regulatory dilemma because low-level contamination to air, water, soil, and food products is relatively common in agricultural applications even when pesticides are used in a manner consistent with labeling directions.\textsuperscript{149} Moreover, even where a violation can be established, it may be difficult to trace the causal link between the labeling or use infraction and specific contamination. Finally, where infractions lead to enforcement actions, there is little evidence that the moderate penalties imposed cause significant changes in the patterns of intensive pesticide use.\textsuperscript{150}

The EPA's efforts to eliminate the harmful environmental impacts from atrazine and cyanazine, carcinogenic herbicides with a propensity for contaminating surface and groundwater, illustrate the incremental enforcement problem.\textsuperscript{151} The special review process for these chemicals, begun in the mid-to late 1980s, resulted in labeling restrictions but no cancellation.\textsuperscript{152}

\textsuperscript{148} See, e.g., Oregon Environmental Council v. Kunzman, 714 F.2d 901, 905-06 (9th Cir. 1983) (finding compliance with labeling requirements despite unrefuted allegations that spraying operations caused exposures to skin and eyes of residents).

\textsuperscript{149} See, e.g., SUSAN KEGLEY ET AL., DISRUPTING THE BALANCE: ECOLOGICAL IMPACTS OF PESTICIDES IN CALIFORNIA38-66 (1999).

\textsuperscript{150} Modest labeling or use penalties, while potentially effective against egregious violators, have little impact on the heavy pesticide use patterns in agricultural states such as California. See, e.g., SUSAN KEGLEY, STEPHAN ORME & LARS NEUMEISTER, CALIFORNIANS FOR PESTICIDE REFORM, HOOKED ON POISON: PESTICIDE USE IN CALIFORNIA, 1991-1998 (2000). For example, DPR recently noted 685 enforcement cases by 42 agricultural commissioners representing a total of $197,432 collected, or an average of $288 per violation. DEPARTMENT OF PESTICIDE REGULATION, CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, COUNTY AGRICULTURAL COMMISSIONER ADMINISTRATIVE CIVIL PENALTY REPORT 2 (1999). See also Panhandle Co-op. Ass'n, Bridgeport, Neb. v. Envtl. Prot. Agency, 771 F.2d 1149, 1151 (1985) (imposing a $5,000 fine for labeling violations on a pesticide company with annual sales of $35 million); Department of Pesticide Regulation, California Environmental Protection Agency, Department of Pesticide Regulation Takes Action to Suspend License of Kern County Pesticide Business, Aug. 20, 1997, available at http://www.cdpr.ca.gov/docs/archives/pressrls/1997/inland.htm (noting that numerous notices of violations and civil penalties had previously been filed against the applicator prior to license suspension); Department of Pesticide Regulation, California Environmental Protection Agency, Monterey County Pesticide Applicators Fined for Pesticide Misuse, May 17, 1996 (announcing fines, for violations of restrictions on Methyl bromide use, of only $800 and $3,000). In addition, penalties for use or label violations have little if any effect on pesticide manufacturers.

\textsuperscript{151} Atrazine was first registered in 1959, and cyanazine in 1971, both before the passage of FIFRA's unreasonable risk standard. See Atrazine, Simazine and Cyanazine; Notice of Initiation of Special Review, 59 Fed. Reg. 60,412, 60,414-16 (1994).

\textsuperscript{152} See Atrazine, Simazine and Cyanazine, supra note 151; Cyanazine; Intent to Cancel Registrations, Denial of Applications for Registrations, Conclusion of Special Review 53 Fed. Reg. 795 (1988). Each of these reviews concluded with application restrictions to protect handlers and applicators and label amendments warning of
The EPA reinitiated special review in 1994, however, after uncovering additional information regarding exposures to workers and the environment. Nevertheless, today, despite evidence of unreasonable environmental risk dating back to the mid-1980s, both chemicals are still in use, although cyanazine is currently scheduled to be phased out of use by the year 2002.

d. Limits of FIFRA in Promoting Non-Toxic Alternatives

FIFRA's greatest shortcoming as a protective statute lies in its failure to promote safer, non-toxic alternatives to pesticide products. As a licensing statute, FIFRA necessarily focuses the regulatory debate on pesticide manufacturers and distributors, both of which hold strong vested interests in continuing the long-term use of chemically-based pest control. Through its focus on pesticide "risk," FIFRA's administrative process becomes dominated by quantitative risk assessment, in which incremental risk reduction is accomplished one pesticide use at a time for individual chemicals. This approach inevitably minimizes attention on alternative forms of pesticide control that might be just as acceptable to pesticide users. In registering pesticides, for example, the EPA is not authorized to deny a registration based solely on the existence of a preferred less toxicity and the potential for leaching. During this time, the EPA requested data on both chemicals for additional toxicity studies, usage, ground and surface water monitoring and environmental fate and ecological effects.

153. Atrazine, Simazine and Cyanazine, supra note 151.


155. See Applegate, supra note 84, at 312.

156. Integrated pest management, or "IPM," combines biological, cultural, physical and chemical tools to manage pests. IPM relies on collection and interpretation of field data to determine pest infestation thresholds, protect non-target and beneficial species, and utilize predators and parasites. In emphasizing sustainability and healthy ecosystems, traditional IPM relies on chemical controls only as a measure of last resort.
harmful alternative. In enforcement actions, FIFRA's cost benefit analysis discourages significant consideration of reduced or non-chemical methods of pest control by creating an artificial comparison between a world based on heavy pesticide use and one in which pests are uncontrolled. As a result, FIFRA places relatively little pressure on the agricultural industry to move towards alternative technologies that do not substantially rely on toxic chemicals. To the extent that pressure is exerted by EPA, it is borne largely by manufacturers rather than users. Thus, instead of promoting non-toxic alternatives, FIFRA establishes a regulatory environment in which manufacturers can debate the merits of various EPA risk assessments for years, fortified by a comparatively unlimited amount of time and resources, particularly for those pesticides currently in use and earning daily profits. By the time one pesticide's registration is ultimately canceled, a company is often ready to bring a new, but not necessarily less toxic, pesticide product to market. In sum,

157. Merrell v. Thomas, 807 F.2d 776, 781 (9th Cir. 1986) (distinguishing FIFRA from NEPA by noting that FIFRA does not imply a preference for the less environmentally harmful alternative).

158. The feasibility of safer alternative designs is a key criteria of risk-benefit balancing in product liability law. Brown v. Super. Ct., 44 Cal. 3d 1049, 1061 (1988). In Brown, the Court rejected as overly narrow the defendant drug manufacturers' argument that an alternative design was impossible, based on the reasoning that possible "alternatives" such as removal of a particular drug component that may be largely responsible for the increased risk or using alternative drugs to achieve the same medical result had not been explored. Id at 1062. Under FIFRA, the absence of a readily available pesticide alternative would likely prevent an EPA enforcement action. See, e.g., Love v. Thomas, 858 F.2d 1347, 1362 (9th Cir. 1988) (stating that EPA's "insensitivity to the local economic problems caused by its decision is unbecoming and inappropriate"); Envtl. Def. Fund v. Envtl. Prot. Agency, 510 F.2d 1292, 1302 (1975) (reviewing EPA's finding that existing pesticide alternatives are just as effective in controlling pests under substantial evidence standard).

159. Restrictive labeling neither affects the behavior of pesticide manufacturers nor creates incentives for the agricultural industry to reduce its dependence on pesticides. See supra note 150.

160. The length of EPA's 20-year struggle to reign in the adverse environmental impacts of the triazine pesticides, as discussed above, is wholly consistent with EPA's earlier efforts to cancel harmful pesticides in the 1980s. Actions against Captan, ethylene bisdithiocarbamates (EBCDs) and Alar took 9, 12 and 17 years respectively. See Hornstein, supra note 97, at 437-38 ("informational demands of risk analysis doom the regulatory process to a perpetual state of slow motion."); Marina M. Lolley, Carcinogenic Roulette: A Game Played Under FIFRA, 49 Md. L. Rev. 975, 991 n.141 (1990).

Despite EPA's authority to push for safer chemical alternatives,\textsuperscript{162} the scope of the debate still rests tightly within the control of the pesticide industry.\textsuperscript{163}

\textit{B. Other Federal Laws Regulating Pesticide Use}

FIFRA's regulatory shortcomings are particularly problematic due to the fact that commercial pesticide applications by and large escape regulation under traditional command and control statutes such as the federal Clean Water Act and Clean Air Act. The Clean Water Act specifically excludes "agricultural stormwater discharges and return flow from irrigated agriculture" from its regulatory ambit.\textsuperscript{164} Many other forms of agricultural pollution are considered "non-point source" discharges and are not directly regulated.\textsuperscript{165} In similar fashion, the Clean Air Act does not consider agricultural operations to be "stationary sources" subject to regulation under the hazardous air pollutant program.\textsuperscript{166} Thus, aerial pesticide drift from


162. Newly registered pesticides by EPA often promise to replace those more environmentally damaging chemicals of the previous generation. See, e.g., Office of Pesticide Programs, U.S. EPA, \textit{Conditional Registration of Isoxaflutole}, at http://www.epa.gov/pesticides/chemicals/oxaflutole.htm (Sept. 1998) (allowing use of a new conditionally registered chemical instead of atrazine, a known contaminant); Office of Pesticide Programs, \textit{supra} note 132 (newly registered pesticide acetochlor is designed to substitute for herbicides alachlor, metolachlor, atrazine, EPTC, butylate and 2,4-D).

163. As discussed, despite its strong protective language, FQPA's fundamental reliance on quantitative risk assessment as the principal tool of regulation limits its ability to break this cycle. See \textit{supra} notes 131-137 and accompanying discussion.


165. The Clean Water Act applies technology-based controls to "point source" discharges, see 33 U.S.C. § 1311 (1994), but largely leaves the regulation of non-point pollution sources to states based on recommended "best management practices." 33 U.S.C. § 1314(f)(2)(A) (1994) (requiring EPA to issue "processes, procedures, and methods to control pollution resulting from agricultural and silvicultural activities, including runoff from fields and crops and forest lands"); \textit{see also} Nat'l Wildlife Fed'n v. Gorsuch, 693 F.2d 156, 164-166 (D.C. Cir. 1982); \textit{infra} note 208 and accompanying discussion regarding California's regulation of non-point source pollution.

166. 42 U.S.C. § 7412(a) (1994) limits regulation of sources of hazardous air pollutants to stationary sources, which are defined in 42 U.S.C. § 7411(a)(3) (1994) as "any building, structure, facility or installation which emits or may emit any air pollutant." \textit{See also} 40 C.F.R. § 61.02 (2000). Even if the EPA had created a source
spraying or other applications is not regulated under the Clean Air Act.\textsuperscript{167}

Another federal statute with potential jurisdiction over pesticide contamination is the federal Safe Drinking Water Act, ("SDWA").\textsuperscript{168} Under the SDWA, the EPA must establish "maximum contaminant levels" ("MCLs") for certain toxic pollutants occurring in drinking water sources.\textsuperscript{169} Under FIFRA, these pesticide MCLs can provide a contamination benchmark on which EPA may rely in assessing the need for special review or additional data requests.\textsuperscript{170} The usefulness of SDWA to pesticide regulation is limited, however, for several reasons. First, the statute only applies to a limited number of listed pesticide contaminants; thus, it fails to reach many other known surface or ground water contaminants.\textsuperscript{171} Second, the SDWA regulates public water systems by measuring concentrations at the tap and not the discharge point, and thus assumes a maximum aggregate total for each pesticide contaminant that is well above what any one discharger would be permitted to release were the MCL allocated among all activities in a given water system. Finally, in setting MCLs, the EPA must consider the economic feasibility of treatment technologies used by public water systems, without consideration of the existence of other technologies with the potential to reduce overall discharges into the water system.\textsuperscript{172}

\textsuperscript{167} Pesticides have also escaped regulation under CERCLA. See 42 U.S.C. § 9607(l) (1994) ("no person . . . may recover under the authority of this section for any response costs or damages resulting from the application of a pesticide product registered under [FIFRA]").

\textsuperscript{168} 42 U.S.C. § 300f (1994) et seq.

\textsuperscript{169} 42 U.S.C. § 300g(1)(A) (1994); 40 C.F.R. § 141.61(c) (2000); see BRAD HEAVNER, TOXICSES ON TAP: PESTICIDES IN CALIFORNIA DRINKING WATER SOURCES 20 (1990). Under its own Safe Drinking Water Act, California has set MCLs for an additional four pesticides. See CAL. HEALTH & SAFETY CODE § 116,365 (West 2000); CAL. CODE REGS. tit. 22, § 64444 (2001). Pesticides for which MCLs have been set by federal and California authorities include such water contaminants as alachlor, atrazine, carbofuran, molinate, thiobencarb and 2,4-D. Id.

\textsuperscript{170} See, e.g, 40 C.F.R. § 158.179(b) (2000) (detection of a pesticide in water at 10% of its MCL must be reported to EPA by registrants).

\textsuperscript{171} Many pesticides found in California surface or ground waters, including chlorpyrifos, diazinon, diuron, bromacil, methyl bromide, and carbaryl, have no MCLs under either the federal or state Safe Drinking Water Acts. See HEAVNER, supra note 169, at 11-22. The federal SDWA places the burden squarely on EPA, or state authorities, to establish MCLs, which, in a similar manner to FIFRA, slows implementation of the SDWA.

\textsuperscript{172} 42 U.S.C. §§ 300g-1(b)(3)(C), 300g-1(b)(4) (1994). Under these sections, MCLs shall be set as close as is feasible to "the level at which no known or anticipated
The Endangered Species Act ("ESA") also has potential regulatory impacts on pesticide use. At least one federal appellate court has held that the continued registration of a pesticide use that jeopardizes the survival of an endangered species constitutes an "unreasonable impact" upon the environment and thus should be canceled. To address the possibility of such impacts, the EPA created the Endangered Species Protection Program in 1988 to protect endangered species from pesticide use. Despite the establishment of this program, however, the EPA has done little to protect endangered species from pesticide use over the last two decades.

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adverse effects on the health of persons occur." "Feasible" is subsequently defined as the best treatment techniques or technology that is "available," under field conditions taking cost into account. 42 U.S.C. § 300g-l(b)(5) (1994).

173. See, e.g., Defenders of Wildlife v. Administrator, Envtl. Prot. Agency, 882 F.2d 1294, 1298-1299 (8th Cir. 1989). This case also found that the registration of a harmful pesticide may constitute a "take" of an endangered species, requiring consultation under Section 7 of the ESA and an incidental take permit under Section 9. Id. at 1301-03. The court's decision is consistent with the history of FIFRA's 1972 amendments, which were enacted in large part in response to the adverse effects of pesticides such as DDT on wildlife species. See Bosso, supra note 80, at 109-42; Envtl. Def. Fund v. Envtl. Prot. Agency, 465 F.2d 528, 532 (D.C. Cir. 1972); Envtl. Def. Fund v. Envtl. Prot. Agency, 548 F.2d 998 (D.C. Cir. 1976). FIFRA regulations reflect this focus by specifically authorizing EPA to initiate special review for a pesticide that may pose a risk to the continued survival of an endangered species or adversely affect its critical habitat. 40 C.F.R. §§ 154.7(a)(4-5) (2000).

174. EPA's failure to protect endangered species under FIFRA is in large part due to lack of implementation. In 1991, for example, EPA issued "may affect" determinations under Section 7 of the ESA for only thirty-one pesticides out of the hundreds registered for use. See Endangered Species Protection Program May Affect Determinations, 56 Fed. Reg. 10,886 (1991). The Fish and Wildlife Service has yet to complete consultation, however, on a single pesticide used in agricultural applications. In 1993 USFWS issued a biological opinion for the 16 vertebrate control agents on the EPA list. See USFWS, BIOLOGICAL OPINION, MARCH, 1993: EFFECTS OF 16 VERTEBRATE CONTROL AGENTS ON THREATENED AND ENDANGERED SPECIES (1993). Thus, today the effects of agricultural pesticides on endangered species are largely unknown. See, e.g., Final Rule to List the Topeka Shiner as Endangered, 63 Fed. Reg. 69,008, 69,014, (1998) ("many agricultural chemicals have yet to undergo section 7 consultation and the subsequent Environmental Protection Agency implementation of reasonable and prudent measures to minimize incidental take of listed species."). No doubt the federal lack of follow through on endangered species protection relates to a stated purpose of the Endangered Species Protection Program, "to be responsive to the needs of agricultural production in this country by developing a program that can be readily implemented without unnecessary burden on pesticide users." Endangered Species Act Program, 54 Fed. Reg. 27,984 (1989). In addition to politics, scientific uncertainty also plays a role in preventing protection. Unlike the immediate adverse impacts caused by the organochlorines on wildlife, for example, the impact of today's second and third generation pesticide products is more subtle and difficult to trace. See, e.g., Theo Colborn ET AL., OUR STOLEN FUTURE (1997); Sharon K. Taylor, Elizabeth S. Williams & Ken W. Mills, Effects of Malathion on Disease Susceptibility in Woodhouse's Toads, 35 J. OF WILDLIFE DISEASES 536 (1999); Carey & Bryant, supra note 119.
C. Pesticide Use and Regulation in California

In California, the Department of Pesticide Regulation ("DPR") regulates pesticide use under delegated authority from FIFRA. According to the California Food & Agriculture Code, pesticide regulation should protect public health and safety and the environment, assure agricultural workers safe working conditions, ensure proper labeling of pesticides and encourage less harmful alternatives for controlling pests. Thus, a primary statutory directive for DPR is to eliminate the use of any pesticide that endangers the agricultural or non-agricultural environment. To fulfill its statutory mandate, DPR is given broad authority to deny or cancel a registration for any pesticide that creates serious and uncontrollable adverse environmental impacts, even if the pesticide is registered under federal law. As a condition of registration, the DPR may also place appropriate restrictions on the use of a pesticide, including limitations on the quantity, area, and manner of application. Finally, DPR may designate certain pesticides as "restricted

175. DPR took over regulatory authority from the Department of Food and Agriculture in 1991 as part of the reorganization that created the California Environmental Protection Agency.
178. See CAL. FOOD & AGRIC. CODE § 12,824 (West 2001). State law defines "environment" broadly to include "the aggregate of all factors that influence the conditions of life in or about the state... which are affected by the use of pesticides." CAL. FOOD & AGRIC. CODE § 14.101 (West 2001). In addition to federal requirements, pesticides must be registered in California. See CAL. FOOD & AGRIC. CODE § 12,815 (West 2001). The registration period is 12 months, at which time renewals typically are freely granted. See CAL. FOOD & AGRIC. CODE § 12,817 (West 2001); see also CAL. CODE REGS. tit. 3, § 6,215 (2001); see, e.g., Department of Pesticide Regulations, Notice of Proposed and Final Decisions, Jan. 3, 2000 (providing notice of DPR's monthly proposed decision to register pesticide products).
179. See CAL. FOOD & AGRIC. CODE §§ 12,825, 12,827.5 (West 2001). DPR may cancel or deny a pesticide registration for any of the following reasons: a) "serious uncontrollable adverse effects either within or outside the agricultural environment;" b) adverse environmental impacts outweigh the benefits received; c) less harmful alternatives exist; d) detrimental to beneficial vegetation, or to public health and safety when properly used; e) little value for the intended purpose; or f) false or misleading statements are made about the pesticide product. CAL. FOOD & AGRIC. CODE § 12,825(a)-(l) (West 2001).
180. See CAL. FOOD & AGRIC. CODE § 12,824 (West 2001). DPR may also establish specific criteria, including specific performance standards and tests, to evaluate whether a pesticide is having adverse effects on the environment. Id.
materials" if they present a danger of harming public health or the environment.\textsuperscript{181}

Despite these expansive powers, neither DPR nor its agency predecessors have used the registration requirement as a means to reduce pesticide use in California.\textsuperscript{182} Instead, pesticide use continues to rise in California, increasing 40\% between the years 1991 to 1998.\textsuperscript{183} As is true under FIFRA, the overall lack of data regarding the health effects and environmental fate of specific pesticides represents an enormous obstacle to more comprehensive risk assessment. To remedy this information gap, the state legislature passed the Birth Defect Prevention Act ("BDPA") in 1984. The BDPA requires DPR to inventory all pesticide active ingredients used in California and to assess any toxicological "data gaps" that exist for each ingredient.\textsuperscript{184} The BDPA envisioned an orderly procession, in which data gaps would be filled by studies initiated by registrants or by the DPR at registrants' expense.\textsuperscript{185} The failure of registrants to submit data on a timely basis, however, resulted in subsequent legislative amendments threatening to suspend any currently registered pesticide for which data gaps existed after March 30, 1996.\textsuperscript{186} Despite this mandatory language, however, the BDPA has had no more success than the FIFRA reregistration process.

\textsuperscript{181} CAL. FOOD \& AGRIC. CODE § 14,004.5 (West 2001). Subject to limited exceptions, operators proposing to apply such "restricted" pesticides must obtain a permit from DPR, which limits uses to prevent potential injuries. See CAL. FOOD \& AGRIC. CODE §§ 14,005, 14,006 (West 2001).

\textsuperscript{182} Annual registration renewal of pesticides in California is mostly automatic, with the exception of DPR's occasional request for additional information.

\textsuperscript{183} The overall use of pesticides during this time period was 1.5 billion pounds and the average annual increase was 7.2 million pounds. KEGLEY, ORME \& NEUMEISTER, supra note 150, at 6. Pesticide sales increased an average of 12.4 million pounds per year during this time, indicating that actual use may be even higher. Id. ("The difference between reported pesticide sales and reported pesticide use shows that a significant fraction of pesticide use in California goes unreported.").

\textsuperscript{184} See CAL. FOOD \& AGRIC. CODE § 13,121 et seq. (West 2001). "Data gaps" exist for any pesticide that has not been studied for adverse reproductive effects, chronic toxicity, mutagenic effects, neurotoxic effects, oncogenic (tumor-causing) effects, or teratogenic effects. See CAL. FOOD \& AGRIC, CODE § 13,125(c) (West 2001). The BDPA required DPR's predecessor, the Department of Food and Agriculture (DFA), to identify 200 pesticide active ingredients for which the most significant data gaps occurred. CAL. FOOD \& AGRIC. CODE § 13,127(a) (West 2001).

\textsuperscript{185} See CAL. FOOD \& AGRIC. CODE § 13,127(a)-(f) (West 2001). California's Department of Pesticide Regulation originally not only had authority under the Act to fill data gaps by conducting its own toxicology, but also could assess the costs to the pesticide registrants. See CAL. FOOD \& AGRIC. CODE § 13,127(c)(1) (West 2001). This authority has since been superseded by a discretionary statutory charge on registrants for delays in data submissions. See CAL. FOOD \& AGRIC. CODE § 13,127.6 (West 2001).

\textsuperscript{186} See CAL. FOOD \& AGRIC. CODE § 13,127.32 (West 2001).
in eliminating dangerous chemicals from use in California.\textsuperscript{187} Similar to the pattern under FIFRA, the predictable outcome has been additional extensions of the statutory deadlines\textsuperscript{188} and a tendency on the part of DPR to collect data rather than take regulatory action.\textsuperscript{189}

In response to the perceived lack of information regarding the environmental fate of pesticides, the state legislature enacted two additional statutes to protect citizens from contamination to groundwater and air.\textsuperscript{190} To "prevent further pesticide pollution of the groundwater aquifers . . . which may be used for drinking water supplies," the legislature enacted the Pesticide Contamination Prevention Act ("PCPA") in 1985.\textsuperscript{191} The Act requires that where a particular pesticide is found in groundwater as a result of normal agricultural use in accordance with state and federal laws, the state shall cancel the registration of that pesticide unless DPR finds that the levels of pesticide found in the groundwater are not harmful or can be reduced by

\begin{itemize}
\item High risk pesticides used in California include the fumigants metam sodium, methyl bromide, chloropricrin, 1,2-dichloropropene (Telone) and sulfuryl fluoride, the fungicides manebl, captan, chlorothalonil and mancozeb, the herbicides diuron, paraquat dichloride, and molinate, and the insecticides chlorpyrifos, propargite and diazinon. Use of these pesticides increased significantly from 1991 to 1995 and has remained at high levels since that time. See \textbf{KEGLEY, ORME \& NEUMEISTER, supra} note 150, at 20; \textbf{JAMES LIEBMAN, RISING TOXIC TIDE: PESTICIDE USE IN CALIFORNIA, 1991-1995} (1997), available at http://www.igc.org/panna/risingtide/textoftide.html.
\item DPR did not hesitate to approve the continued use of chlorpyrifos for household products, for example, despite studies that led to some chlorpyrifos uses being banned by EPA under FIFRA. See \textbf{supra} note 132 and accompanying discussion. Even where data gaps have been filled, questions remain regarding the limitations of standard toxicity testing in protecting public health and safety. See \textbf{supra} note 119 and accompanying discussion.
\item California also regulates food safety by incorporating federal tolerances for pesticide residues on food products while retaining authority to establish more stringent tolerances, through petition to EPA, where stricter standards are justified by compelling local conditions. See \textbf{21 U.S.C. § 346a(n)(5)(C)(i) (1996)}. California also has authority to require warnings about the presence of pesticide residues on any food products sold within the state. See \textbf{21 U.S.C. § 346a(n)(8) (1996)}.\textsuperscript{190}
\item \textbf{CAL. FOOD \& AGRIC. CODE} § 13,141(g) (West 2001). Pesticide "pollution" is defined as the introduction of pesticide products "above a level, with an adequate margin of safety, that does not cause adverse health effects." \textbf{CAL. FOOD \& AGRIC. CODE} § 13,142[j].
\end{itemize}
modifying the use of the pesticide so that such use will not "significantly diminish the margin of safety" required to avoid adverse health effects.\footnote{192}

To address the problem of pesticide contamination of air, the legislature established the Toxic Air Contaminant ("TAC") program in 1983.\footnote{193} Under the TAC program, DPR, in consultation with the state Air Resources Board and OEHHA, identifies certain pesticides that pose a present or potential hazard to human health as "toxic air contaminants."\footnote{194} In assessing whether a pesticide poses a potential hazard, the DPR shall consider a number of factors, including the levels of exposure that may cause or contribute to adverse health effects and the range of anticipated risks to humans.\footnote{195} A pesticide considered to be a toxic air contaminant shall be subject to additional control measures including, where appropriate, use restrictions or cancellation of registration.\footnote{196}

Notwithstanding these statutory mandates, pesticide regulation in California has been largely ineffective in preventing pesticide exposures to California citizens and to the

\footnote{192. \textit{CAL.} FOOD \& AGRIC. CODE §§ 13,149-13,151 (West 2001). The Director of DPR has authority to overturn the subcommittee's recommendation to cancel a pesticide based on the Director's written determination that no pollution or threat of pollution exists. \textit{See CAL.} FOOD \& AGRIC. CODE § 13,150(d)(4) (West 2001).


194. \textit{CAL.} FOOD \& AGRIC. CODE §§ 14,021, 14,023(d) (West 2001). When it enacted the TAC program, the legislature was aware that DPR would be under political pressure not to list pesticides as TACs. For that reason, the initial legislation required DPR to incorporate as TACs the 34 pesticides identified as "Hazardous Air Pollutants" (HAPs) under the Clean Air Act. \textit{See} \textit{CAL.} FOOD \& AGRIC. CODE § 14,021(b) (West 2001). Hazardous air pollutants were listed by Congress in the 1990 amendments to the federal Clean Air Act. \textit{See} 42 U.S.C. § 7,412(b) (1994). The legislature intended for the TAC program to regulate and mitigate the effects of use of these federally listed pesticides through monitoring, establishment of standards, and, where appropriate, use restrictions or cancellations of registrations. \textit{See} \textit{CAL.} FOOD \& AGRIC. CODE § 14,024 (West 2001). Despite the wishes of the legislature, however, DPR failed to conduct any of the monitoring required to enforce the statute. Instead, DPR claimed that the statute did not require such monitoring even though, as a result, HAP/TACs were not regulated under the TAC program for years. \textit{See} Letter from DPR to The Honorable Fred Keeley, Assemblyman 8 (Apr. 16, 1997). DPR has since retreated from this untenable legal position. \textit{See} Memo from Ronald Oshima, Department of Pesticide Regulation, to Doug Okumura, Department of Pesticide Regulation, \textit{Procedures to Address the Status of Toxic Air Contaminant Candidates} 5 (Aug. 20, 1998) (stating that HAP/TACs would be included in TAC risk assessment and monitoring program).

195. \textit{See} \textit{CAL.} FOOD \& AGRIC. CODE § 14,023(a) (West 2001).

196. \textit{See} \textit{CAL.} FOOD \& AGRIC. CODE § 14,024 (West 2001).}
environment. As is true at the federal level, California's reliance on a license-based approach is a chief reason for this failure. Despite its authority to do so, DPR consistently has declined to impose more stringent restrictions on pesticide

197. The 1985 PCPA, while initiating at least the beginnings of a state groundwater monitoring program for pesticide pollution, has not led to significant restrictions on groundwater contaminating pesticides used in California. See HEAVNER, supra note 171, at 30-33. A main problem with the PCPA has been DPR's failure to conduct comprehensive groundwater monitoring for the 63 pesticides listed on the Groundwater Protection List as likely to leach into groundwater. Id. at 32-33; see also WILLIAM PEASE ET AL., PESTICIDE CONTAMINATION OF GROUNDWATER IN CALIFORNIA 62-70 (1995).

The legislature's attempt through the TAC process to apply a more traditional regulatory approach to aerial drift of toxic pesticides also has mostly failed. Since the program's inception in 1983, DPR has listed only three pesticides as TACs, none of which are widely used in California. Two of these, ethyl and methyl parathion, have already been banned for most uses by the EPA. In comparison, over the same time period, the Air Resources Board listed 19 toxic chemicals as TACs. See CALIFORNIANS FOR PESTICIDE REFORM, POISONING THE AIR: AIRBORNE PESTICIDES IN CALIFORNIA 14-18 (1998) [hereinafter POISONING THE AIR]. As this report discusses, DPR published 4 different lists containing approximately 150 "candidate TACs" during this 15 year period, but listed only one chemical. In 1996, DPR published a list of 134 potential TAC pesticides, which were ranked according to the threat posed. See DEPARTMENT OF PESTICIDE REGULATION, CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, PESTICIDES FOR EVALUATION AS CANDIDATE TOXIC AIR CONTAMINANTS (1996), available at http://www.cdpr.ca.gov/docs/empm/pubs/tac/ch96-01.pdf. Since that time, however, DPR has listed only two pesticides as TACs. See Transcript of September 17, 1999 Meeting of the Scientific Review Panel, 142, available at www.arb.ca.gov/srp/ml091799.htm.

In evaluating pesticides, DPR has faced huge data gaps regarding pesticide exposures—information required for listing under the TAC program. See CAL. FOOD & AGRIC. CODE § 14,023(a) (West 2001). Rather than take the lead on creating such data, however, DPR has dragged its heels. DPR monitoring, conducted on contract by the Air Resources Board, has been sporadic and infrequent. The monitoring that has taken place has been criticized for failing to characterize the actual level of pesticide exposures to citizens living in rural communities. See, e.g., Susan Kegley, Critique of the Department of Pesticide Regulation's Phase One Lompoc Air Monitoring (1999) (on file with author). Finally, even when monitoring has revealed relatively high levels of exposures, DPR has routinely failed to take any action. See, e.g., AIR RESOURCES BOARD, CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, REPORT FOR THE APPLICATION AND AMBIENT AIR MONITORING OF CHLORPYRIFOS (AND THE OXON ANALOGUE) IN TULARE COUNTY DURING SPRING/SUMMER, 1996 (1998) (showing consistent detections of chlorpyrifos); Lynton Baker et al., Ambient Air Concentrations of Pesticides in California, 30 ENVTL. SCI. & TECH. 1356 (1996) (summarizing Air Resources Board air monitoring results, which indicate detections of numerous airborne pesticides, including dichloropropene, methyl bromide, and metam-sodium, at levels indicating public health concern); AIR RESOURCES BOARD, MOLINATE APPLICATION MONITORING REPORT: (1992) available at http://www.cdpr.ca.gov/cgi-bin/byteserver.pl/docs/empm/pubs/tac/tacpdfs/molinate.pdf (showing high levels of molinate in ambient air); see also James N. Seiber, Michael M. McChesney & James E. Woodrow, Airborne Residues Resulting from Use of Methyl Parathion, Molinate and Thiobencarbo on Rice in the Sacramento Valley, California, 8 ENVTL. TOXICOLOGY & CHEMISTRY 577 (1989). Of the pesticides detected in these and many other reports and studies, only methyl parathion has been listed by DPR as a TAC.
registration than those that already exist under federal law.\textsuperscript{198} Finally, despite DPR's authority under the BDPA to cancel pesticide registrations for lack of sufficient data, few registrations for current use pesticides have been canceled.\textsuperscript{199}

California's dilemma in regulating pesticide pollution is illustrated by the recent efforts to control pesticide runoff to surface waters. Unlike the U.S.E.P.A. under the federal Clean Water Act, the State Water Resources Control Board maintains authority under California's Porter-Cologne Act to regulate non-point sources of water pollution, which include pesticide runoff.\textsuperscript{200} Rather than exercising this authority, however, the regional boards have waived waste discharge requirements for agricultural sources of pesticide pollution, deferring instead to the regulatory oversight of DPR to control surface water contamination.\textsuperscript{201}

Not surprisingly, DPR regulation has been largely ineffective. Multiple pesticides are often found in California's rivers and streams and toxic pulses of pesticides from stormwater and irrigation runoff are common occurrences.\textsuperscript{202} In an attempt to

\begin{flushleft}198. See Letter from Rudy Lapurga, Registration Specialist, Department of Pesticide Regulation, California Environmental Protection Agency, to Michael Graf, Altshuler, Berzon, Nussbaum, Berzon & Rubin (Dec. 10, 1999) (on file with the author).

199. See DEPARTMENT OF PESTICIDE REGULATION, supra note 188 (noting that of the 200 priority active pesticidal ingredients, only two with actively registered products had been suspended. Approximately 50 other ingredients were no longer registered in California.).


201. Under CAL. WATER CODE § 13269 (West 1992), regional boards may grant waivers to specific types of discharge where such waiver is not against the public interest. Since 1982, the Central Valley Regional Water Quality Control Board ("CVRWQCB") has waived WDRs for stormwater discharge, pesticide rinse waters from applicators, and irrigation return water. See CENTRAL VALLEY REGION, CALIFORNIA WATER QUALITY CONTROL BOARD, supra note 74, at IV-22.00-IV-23.00; Central Valley Region, California Water Quality Control Board, Resolution No. 82-036 (March 26, 1982). Recently enacted California law subjects all waivers to a 5-year duration, subject to renewal through a public hearing process. Waivers in effect on January 1, 2000 must be renewed or terminated by January 1, 2003. See 1999 Cal. Stat. 686 § 2 (amending sections 13269 and 13350 of the California Water Code). It is unclear whether the public hearing process requirement will alter the Board's previous conclusion that WDR waivers for pesticide runoff pollution are in the "public interest."

202. See LEVNER, supra note 171, at 39; KEGLEY ET AL., supra note 150, at 39-44. The most commonly detected pesticides in California surface waters are atrazine, chlorpyrifos, carbofuran, diazinon, methidathion, molinate, simazine, cyanazine, bromacil, diuron, thiobencarb, metolachlor, and carbaryl. Id; Department of Pesticide Regulation, Preliminary Results of Acute and Chronic Toxicity Testing of Surface
remedy this situation, the State Water Resources Control Board has entered into cooperative agreements with DPR that envision eventual water quality regulation by the Regional Boards should DPR regulation prove insufficient to control pesticide discharges.203 Thus far, however these agreements continue to focus on voluntary best management practices, which have failed to protect California’s waters in the past.204

Eventually, the water quality requirements of the federal Clean Water Act will force water quality regulators to confront pesticide pollution directly. Under Section 303(d), California is required to establish Total Maximum Daily Loads ("TMDLs") for pollutants which cause the "impairment" of water bodies in California.205 Currently, numerous water bodies in California, particularly those in the Central Valley, are considered water quality impaired due to pesticide contamination.206 As pressure
mounts on California to establish and enforce TMDLs for pesticide pollutants, one may expect the SWRCB to adopt a more prominent role in regulating pesticide runoff.

Despite this promise, the potential effectiveness of the TMDL process in controlling pesticide pollution is also doubtful. As is true for risk assessment under FIFRA, the establishment and implementation of enforceable TMDL standards is a resource intensive, politically contentious process. To enforce standards, the regional boards must first conduct sufficient monitoring to establish that a water body is "impaired" due to a pesticide, identify the pesticide, then create a management plan which allocates "amounts" of discharge to the sources in the area, including point sources discharging pursuant to NPDES permits. At this time, no TMDL exists for any pesticide, nor are any currently scheduled to be established in the near future, despite a state obligation to adopt TMDLs that dates back to the late 1970s.207

The length and uncertainty of the TMDL process undermines its ability to force industry to consider non-chemical approaches to pest control. Even once pesticide TMDLs are established, the difficulties of implementation, dependent as always on budget and political considerations, raise further uncertainty regarding their eventual success in controlling pesticide pollution.208

Similar to the chemical "leapfrogging" that occurs under FIFRA, by the time enforcement can occur in the TMDL process, pesticide users may have already switched to an equally toxic but less studied pesticide alternative for which no TMDL has been set, but which may pose as yet undiscovered risk to surface


208. See, e.g., SANTA ANA REGION, CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, STAFF REPORT ON THE REGIONAL WATER QUALITY ASSESSMENT, CLEAN WATER ACT 305(b) REPORT, AND 303(d) LIST UPDATE 3 (1997) ("Schedules for TMDL development after the first two years should be regarded as very tentative. Completion will depend significantly upon the availability of funding, availability of staff, watershed stakeholder group priorities, RWQCB Basin Plan amendment priorities, and further evaluation of the need for and feasibility of TMDLs. If additional water bodies are listed in 1998 or subsequent 303(d) review cycles, TMDL schedules may also need to be revised."). Even the EPA envisions that completion of TMDLs for impaired waters will ultimately be "dependent on resource availability and further evaluation of TMDL applicability and feasibility." EPA, 1998 CLEAN WATER ACT SECTION 303(d) LISTING GUIDELINES FOR CALIFORNIA 5 (1997).
In the meantime, the license-based approach implemented by DPR based on "best management practices" will continue to hold sway, leading to continued pesticide pollution and environmental degradation.

III
APPLICATION OF PROPOSITION 65 TO PESTICIDE USE IN CALIFORNIA

Proposition 65 offers a potentially effective alternative to the traditional methods of controlling pesticide pollution in California. As a liability statute enforced by private citizens, Proposition 65 would force pesticide manufacturers and users to confront the reality of pollution costs currently borne by California's citizens and its physical environment. Indeed, it is not at all clear that pesticide use in California would continue at anything close to current rates if these "externalized" costs were instead borne by those selling and using pesticides. This section will analyze the potential of Proposition 65 to alter fundamentally the manner in which California attempts to control pests.

A. Comparison of Proposition 65 and Current Legal Approaches to Controlling Pesticide Pollution in California

As a statutory liability statute, Proposition 65 offers several clear advantages over the federal and state license-based approach to regulating pesticides, and over traditional common law or statutory command and control regulation. These advantages derive from Proposition 65's flexible liability structure, which, combined with its strict, relatively inflexible regulatory standards, place the burden on the pesticide industry and users to show that unintended exposures pose "insignificant" risk to the public. These advantages may be roughly divided into the following categories: 1) harm-based,
preventative safety standards; 2) burden shifting for quantitative risk assessment; 3) private enforcement; and 4) technology forcing liability models. The subsections below will discuss each in turn.

1. Comparison of Proposition 65's Harm-Based Preventative Safety Standards

As a law that imposes liability on private actors for polluting activities, Proposition 65's standards are exceedingly strict, requiring no proof of negligence by the defendant nor ultimate damages to the plaintiff. Moreover, unlike FIFRA, Proposition 65 does not take the economic costs of regulation into account in determining the appropriate level of protection for public health and the environment. Instead, Proposition 65 applies two purely health based standards, the No Significant Risk Level ("NSRL") for carcinogens and the No Observable Effect Level ("NOEL") for reproductive toxicants. 211

The 1996 Food Quality Protection Act applies comparable health-based standards in regulating pesticide residues on food products. 212 The preventative assumptions of Proposition 65, however, go beyond even FQPA's ambitious standards. For example, where FQPA requires evaluation of a pesticide's cumulative effects only in the rare situations where complete monitoring, toxicological and exposure data exist, Proposition 65 simply assumes the possibility of such effects and applies conservative assumptions to account for this potential for harm. 213 For reproductive toxicants, Proposition 65 applies an across the board 1,000 fold safety factor, a protective standard that while legally possible under FQPA is typically not applied except in cases of significant data gaps on toxicity. 214 Finally, no standard in FQPA (nor FIFRA, the SDWA or the Clean Water Act for that matter) comes close to Proposition 65's discharge

211. As discussed, even the MCLs established under the Safe Drinking Water Act account for the economic costs of regulation. See supra note 172.
212. See supra notes 100, 131-137 and accompanying discussion. For carcinogens, the FQPA standard is actually an order of magnitude higher than that of Proposition 65—one in one million instead of one in one hundred thousand. See supra note 128.
213. See supra notes 36-58 and accompanying discussion: infra notes 349-350 and accompanying discussion.
214. See, e.g., HEALTH EFFECTS DIVISION, OFFICE OF PESTICIDE PROGRAMS, EPA, FQPA SAFETY FACTOR RECOMMENDATIONS FOR THE ORGANOPHOSPHATES (1998). EPA has not recommended any safety factor for most of the organophosphates, and recommended a reduced safety factor of 3 for the majority of those remaining. Id. at 16.
prohibition's conservative assumption that a person will be exposed to the daily amount of a listed chemical discharged by a company into a "source of drinking water." In fact, among preventative health standards, Proposition 65's discharge prohibition is unique in the manner that it protects sources of drinking water from toxic contamination.

2. Comparison of Proposition 65's Burden Shift for Quantitative Risk Assessment

Another unique aspect of Proposition 65 is the manner in which it would shift the burden of quantitative risk assessment to the manufacturers and users of pesticide chemicals. As discussed, the legal burden placed on registrants by FIFRA to show that their pesticide products are safe often falls as a practical matter upon the EPA. The burden borne by the agency under FIFRA allows pesticide manufacturers and users to continue applying a harmful pesticide product for years after adverse impacts are first identified. During this time, neither group is required to bear the externalized costs of their manufacturing and use decisions. In contrast, Proposition 65 lays the burden of quantitative risk assessment at the door of those companies wishing to discharge toxic chemicals as a part of their business operations. Under Proposition 65, a detection of

215. See CAL. HEALTH & SAFETY CODE §§ 25,249.9(b)(2), 25,249.10(c), & 25,249.11(d) (West 2000); supra notes 59-77 and accompanying discussion.
216. See supra notes 123-130. Consider, for example, the detection of a pesticide in air samples surrounding residential areas, and in surface waters considered to be a source of drinking water. Under FIFRA, such a detection might trigger agency action, depending upon the amount detected, the frequency, and the number of personnel and budget EPA, or an implementing state agency such as DPR, could muster to conduct additional monitoring and testing. Assuming that the agency had the resources to assess the toxicity data submitted as part of registration and found them to be incomplete, it could issue a data call-in for additional testing data. If the additional toxicity data and additional monitoring indicated a potentially significant impact on the environment, EPA would have to balance the degree of the threat with the economic interests that favored continued usage. Finally, EPA would have to determine whether to move forward with the special review process and a likely protracted administrative battle over the soundness of EPA's own testing protocols and results. As discussed, it is more likely that EPA would negotiate a series of label restrictions with registrants, which might require revisiting several years later in the event that additional monitoring or new toxicity data reveals a continued threat. See supra notes 146-147. Meanwhile, numerous testing data that might indicate additional threats to health or the environment—comprehensive endocrine testing, testing for synergistic effects, testing for secondary, sublethal and chronic effects on humans and wildlife, for example—would either not be required or fall outside of EPA's budgetary capabilities. See supra notes 111-130 and accompanying discussion.
217. See supra notes 151-154, 160-161 and accompanying discussion.
pesticide exposure or discharge into a source of drinking water directly triggers the Statute's protective provisions. Liability is automatic, unless the defendant can demonstrate, using relevant data and a scientifically valid risk assessment method, that the discharge or exposure was insignificant. A defendant unable to make such a showing is liable for past and present violations. By forcing producers and users of pesticide products to bear the costs of uncertainty, Proposition 65 could force development and use of less harmful alternatives to chemical pest control.

a. Burden of Proof Shift and Scientific Uncertainty

The manner in which a pollution control regime treats the problem of scientific uncertainty is often a good indicator of the level of environmental protection that will be provided. As discussed, under a regulatory “licensing” statute such as FIFRA, EPA faces the formidable task of resolving such uncertainty. Registration carries its own implied presumption of validity, especially given that the quantifiable benefits of maintaining the status quo must, by law, be calculated into the unreasonable impact analysis. As a legal regime, however, FIFRA is not alone in assuming that no harm is occurring unless proven otherwise.

218. Note that even in the face of incomplete monitoring data, a plaintiff in a Proposition 65 action would be able to rely on modeling that extrapolates the observed detection from a single use to many assumed detections from other similar uses that were not monitored. See CAL. CODE REGS. § 12901(g) (2001); infra note 335. Thus, the manufacturer or user cannot avoid liability by proclaiming the need for additional field monitoring.

219. See supra notes 29-34 and accompanying discussion. If the toxicity data were incomplete, a defendant would be unable to show that the risk was insignificant and thus would be liable. Id.

220. As discussed, the statute of limitations for Proposition 65 is continued one year. Accompanying actions under the Unfair Competition Statute, CAL. BUS. & PROFESSIONS CODE § 17200 (West 1997) et seq., may extend this period back 4 years, CAL. BUS. & PROFESSIONS CODE § 1709 (West 1990), although the viability of § 17200 claims after Kraus v. Trinity Management Services, 23 Cal. 4th 116 (2000), is questionable.

221. The problem of cost externalization is illustrated by the decision of cotton farmers in California to switch from mechanical methods to control weeds to the use of the pesticide metam sodium, a developmental and reproductive toxicant, based primarily on the cheaper cost of using chemical controls. Were the externalized costs to health and the environment taken into account by the farmers, the use of the pesticide probably would not have been cost effective. See David Pearce & Robert Tinch, The True Price of Pesticides, in BUGS IN THE SYSTEM: REDESIGNING THE PESTICIDE INDUSTRY FOR SUSTAINABLE AGRICULTURE 64 (William Vorley & Dennis Keeney eds., 1998) (describing how typical policy analyses overstate the benefits of pesticide use). For an easily accessible discussion of cost internalization and ecological economics, see PAUL HAWKEN, THE ECOLOGY OF COMMERCE: A DECLARATION OF SUSTAINABILITY, 57-90 (1993).
Under the common law, for example, a plaintiff must meet the preponderance of the evidence standard in order to establish that the defendant's activities "caused" plaintiff's injuries or damages.\textsuperscript{222} Similarly, most command and control statutes depend upon a regulatory body such as EPA to undertake the job of establishing that concentrations above its selected standard pose a threat.\textsuperscript{223} In general, harm-based statutes such as FQPA or the water quality sections of the Clean Water Act confer a greater degree of protection, often adding an additional "safety factor" when confronted with uncertain toxicity or exposure routes.\textsuperscript{224} Even for such protective, harm-based statutes, however, EPA retains the burden of justifying its chosen safety factor.

Proposition 65 turns this traditional approach on its head by placing the burden of scientific uncertainty squarely on those parties that utilize potentially harmful substances in their business operations. Once a substance is known to be harmful—and is thus listed under the Statute—it is no longer incumbent upon citizens to establish the degree of harm posed on a case by case basis. In this way, Proposition 65 adopts the precautionary principle and challenges industry to demonstrate to a skeptical public that its activities are truly in the public interest.

\textsuperscript{222} The generally accepted jury instruction for the negligence standard of proof states that the "plaintiff has the burden of proving by a preponderance of the evidence of all of the facts necessary to establish all of the essential elements of the claim." In defining the preponderance standard, the instruction goes on to say that "if the evidence is so evenly balanced that you are unable to say that the evidence on either side of an issue preponderates, your finding on that issue must be against the party who had the burden of proving it." BAJI No. 2.60 (8th ed. 1994).

\textsuperscript{223} Both the Clean Water Act and the Clean Air Act require EPA to establish, with the support of substantial evidence, the standards for individual discharge permits. Industry can and often does challenge such standards; such challenges may delay enforcement and consume inordinate amounts of EPA's resources as it defends its scientific conclusions. See, e.g., Union Elec. Co. v. Envtl. Prot. Agency, 427 U.S. 246 (1976); Cleveland Electric Illuminating Co. v. Envtl. Prot. Agency, 572 F. 2d 1150 (6th Cir. 1978); Rybachek v. United States Envtl. Prot. Agency, 904 F.2d 1276 (9th Cir. 1990).

3. **Comparison of Proposition 65’s Private Enforcement Approach**

Proposition 65 passed due in no small part to citizens’ perceptions that federal and state regulators were not protecting them from the discharge or release of toxic chemicals by large companies.\(^{225}\) The drafters of the original initiative utilized this perception and explicitly recognized it in the statutory preamble:

The people of California find that hazardous chemicals pose a serious threat to their health and well being [and] that state government agencies have failed to provide them with adequate protection.\(^{226}\)

To address this failure, Proposition 65 allows private parties to bring enforcement actions when state or local governments decline to participate and offers such private enforcers financial incentives of up to 25% of the statutory penalties (up to $2,500 per daily violation).\(^{227}\) As a result, private enforcement has been the driving force behind implementation of the statute since its inception, accounting for the majority of actions leading to reduction in the use and discharge of toxic chemicals by companies doing business in California.\(^{228}\)

Private enforcement under Proposition 65 offers citizens an opportunity unavailable under FIFRA: the ability to bring their own actions to force pesticide manufacturers and users to reduce impacts on human health and the environment.\(^{229}\) The lack of citizen enforcement under the current regime is particularly noticeable in California, where the DPR’s lax enforcement and oversight of pesticide use during the last two decades has been criticized as politically motivated and underprotective of public health and the environment.\(^{230}\)

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225. See, e.g., AFL-CIO v. Duekmejian, 212 Cal. App. 3d 425, 441 (1989) ("Proposition 65 clearly reflects the result of public dissatisfaction with the state's efforts at protecting the people and their water supply from exposure to hazardous chemicals.").

226. Initiative Measure, Proposition 65, Section 1 (Nov. 4, 1986).


228. See supra note 17.

229. In passing the 1972 Amendments to FIFRA, Congress considered but rejected the idea of a citizen enforcement provision. See Fiedler v. Clark, 714 F.2d 77, 79 (9th Cir. 1983).

230. See, e.g., Liebman, supra note 187, at 5; KEGLEY ET AL., supra note 150, at 19-20; HEAVNER, supra note 171, at 32-41; CALIFORNIANS FOR PESTICIDE REFORM, supra note 197, at 14-18. In many ways, the limited actions taken by DPR to minimize pesticide pollution offer a perfect illustration of the type of agency nonenforcement Proposition 65 seeks to remedy.
contrast, citizen enforcement under Proposition 65 does not depend upon the political will and available resources of an enforcing agency such as EPA or DPR. Instead, private enforcers, offered the possibility of civil penalties and fees, bring cases with or without state or local agency participation, and without the political influences upon regulatory discretion that often accompany agency enforcement.231

In failing to provide for citizen enforcement, FIFRA distinguishes itself from other major federal environmental statutes such as the Clean Air Act, the Clean Water Act and the Endangered Species Act.232 The absence of citizen involvement in FIFRA's enforcement process is not altogether surprising, however, given that neither of FIFRA's enforcement options, civil penalties for use or labeling infractions or restriction/cancellation through the special review process, are in any way suited for citizen involvement. Use or label infractions require agency expertise and experience to identify and pursue. The special review process invokes a complicated, discretionary risk-benefit determination more appropriate for the delegated powers of an administrative agency.

In contrast, Proposition 65's tort-based liability approach creates a simplified enforcement scheme that is ideal for citizen participation. Under Proposition 65, a citizen need only demonstrate an unlawful discharge or exposure; there are no permits or variances to examine, no complicated pollution control technology or methodology to analyze. If a listed chemical is detected, the possibility of liability arises, and the burden of proof regarding safety is shifted to the company.233

231. While the Attorney General's office retains significant oversight authority, limitations on resources prevent the AG from handling all but a percentage of the actions that are brought. See Well Testimony, supra note 16, at 5 (stating that the majority of litigation is done by private parties); AG Brief, supra note 14, at 6 (noting that the Attorney General has limited resources and thus private participation is vital to the enforcement of the statute.) In certain cases, the Attorney General's office may join in a private action in order to retain oversight control over the private enforcement, or may bring its own suit to displace a private party action of which the AG does not approve. See infra note 352.


233. Indeed, Proposition 65 has been characterized by the appellate courts as a "legislative battering ram" that would "tear through the exasperating tangle" of traditional government process. See AFL-CIO v. Duekmejian, 212 Cal. App. 3d 425, 430 (1989). The ease with which citizen enforcers can participate in this process is a credit to Proposition 65's simplified design, but it also raises a larger issue about whether a statute with such blunt instruments of implementation can function as an effective but fair method of pollution control amidst today's complex regulatory environment. This important question will be discussed in the last section.
4. **Comparison of Proposition 65’s Liability Model As Technology Forcing**

Proposition 65’s greatest strength lies in its ability to force companies to internalize the costs of releasing toxic chemicals into the environment, thereby creating incentives to eliminate toxics in the production process. As applied to pesticide use, this aspect of Proposition 65 is especially noteworthy since FIFRA is particularly weak in the area of technology forcing. As discussed previously, FIFRA does not effectively force pesticide manufacturers and users to internalize the costs of pesticide use on human health and the environment. Instead, the detection of an exposure or discharge merely triggers inquiries into whether labeling and uses were lawful, or whether there is a need to initiate the preliminary rounds of special review. While the ultimate loss of a pesticide registration is costly, a manufacturer can usually stave off such a result for many years, during which time pesticide users merely switch to the next pesticide coming off the production line.  

FIFRA’s inability to reduce pesticide use is directly related to its structure as a licensing statute. In licensing pesticide products for commercial use, FIFRA focuses on the broad, policy-based question of whether a pesticide’s environmental risks are acceptable when balanced against the benefits it confers in controlling pests. In contrast, Proposition 65 avoids this larger issue. Proposition 65 does not undergo risk-benefit analysis, nor does it confer authority to ban a pesticide use or to change or restrict labeling or usage. Proposition 65 asks a simpler question: whether there is liability based on an unlawful discharge or undisclosed exposure. Once liability is established, Proposition 65 confers authority on enforcers to seek injunctive

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234. For example, in announcing the implementation of restrictions on chlorpyrifos use for certain agricultural crops, the EPA provided a list of registered chemical alternatives including such toxics as esfenvalerate, permethrin, endosulfan, methomyl, carbaryl, azinphos methyl, phosmet, and dimethoate. See OFFICE OF PESTICIDE PROGRAMS, U.S. EPA, REGISTERED CHEMICAL ALTERNATIVES FOR CHLORPYRIFOS, available at http://www.epa.gov/pesticides/op/chlorpyrifos/alternatives.htm (updated Aug. 12, 2000). Where no such alternative pesticides exist, it is unlikely that EPA could even begin to consider cancellation due to the high resulting “benefits” that would then accrue to the sole pesticide in its field. See, e.g., Love v. Thomas, 858 F.2d 1347, 1363 (9th Cir. 1988) (reversing EPA’s decision to cancel use of pesticide dinoseb due to perceived crop losses); see also Jeff Swiatek, Farm Bureau Sounds Alarm If 2 Insecticides Are Banned: Study Predicts Higher Food Prices, Lower Crop Yields If EPA Ends Use of 2 Chemical Classes, INDIANAPOLIS STAR, May 13, 1999, at C07 (discussing consequences of banning organophosphates and carbamates).
relief and/or civil penalties against the specific activities causing the unlawful discharge or exposure. In this manner, Proposition 65 defers to the pesticide manufacturer or user the question of how best to eliminate the unlawful pollution. As a result, it creates incentives for corporations to avoid liability by developing the technology necessary to eliminate discharges and exposures.

By taking the decision of how or whether a pesticide shall continue to be used out of the hands of the regulatory agency, Proposition 65 could trigger a much broader debate within the regulated community over the most cost-effective manner to control pests. For manufacturers, the possibility of liability creates immediate incentives to develop alternative chemicals that are less toxic and less prone to affecting non-targets. More importantly, pesticide users faced with potential liability for non-point source pesticide pollution will immediately consider a whole range of pest control techniques, including the possibility of dispensing with chemical pesticides altogether where non-chemical alternatives prove to be cost effective. It is this potential which makes Proposition 65's application to pesticides most intriguing since current pesticide laws place little to no pressure on pesticide users—as opposed to pesticide manufacturers—to develop safer technologies. By requiring users to internalize the costs to society of pesticide pollution, Proposition 65 creates the possibility of radically altering pesticide use patterns in California.

B. Proposition 65 and Pesticide Regulation in the 21st Century

Despite its success in curbing the use of toxic chemicals in other industrial sectors, Proposition 65's impact on the widespread and increasing use of pesticides in California remains limited for two reasons. First, many pesticide chemicals, though suspected carcinogens or reproductive toxicants, have not yet been listed under the Statute and thus fall outside Proposition 65's statutory protections. Second, in many respects

235. Indeed, Proposition 65 allows companies to continue exposing persons to toxic pesticides provided they give a warning to those exposed. See CAL. HEALTH & SAFETY CODE § 25,249.6 (West 2000). See infra note 338 and accompanying discussion.

236. The same pattern occurs when a user is required to provide warnings to local citizens regarding exposures. There is a "cost" to providing such warnings, which, while difficult to measure, historically has carried sufficient weight to alter manufacturing and use patterns for other products or technologies. See, e.g., Rechtschaffen, supra note 34, at 341-48; Michael Barsa, California's Proposition 65 and the Limits of Information Economics, 49 STAN. L. REV. 1223, 1246 (1997).
the law is still unsettled as to exactly how Proposition 65 would apply to toxic contamination and exposures caused by pesticides. This section will explore the issues presented by the application of Proposition 65 to pesticide use in California by focusing on three vital questions: whether the pesticide chemical is covered by the Statute, who is potentially liable under the Statute and which actions may give rise to liability.

1. Application of Proposition 65 to Pesticide Use in California

a. Listing of Pesticides as Proposition 65 Chemicals

Proposition 65 only provides protection from toxic chemicals that are listed under the Statute as known to the state to cause cancer or reproductive toxicity.\(^{237}\) In an attempt to avoid the failure characteristic of other regulatory schemes that relied on the administrative agency to determine which chemicals would be regulated,\(^{238}\) the drafters of Proposition 65 required OEHHA's predecessor, the Health and Welfare Agency, to establish an initial list of carcinogenic or reproductively toxic chemicals by March 1, 1987. At a minimum, the list was to include all substances listed as hazardous under the California Occupational Health and Safety Act of 1973.\(^{239}\) To ensure continued vigilance in adding new chemicals, the Statute further requires the list to be revised and republished at least once per year thereafter.\(^{240}\) To streamline the listing process, the Statute

\(^{237}\) See CAL. HEALTH & SAFETY CODE §§ 25,249.5, 25,249.6 (West 2000).

\(^{238}\) During its first twenty years of Clean Air Act enforcement, for example, EPA never listed any toxic chemicals as hazardous air pollutants. Ultimately, Congress was forced to create its own list in the 1990 Clean Air Act Amendments. See 42 U.S.C. § 7412 (1994). Similarly, with the Clean Water Act, it was not until EPA finally applied across-the-board technology-based controls to toxic pollutants that any effective regulation was accomplished. See, e.g., NRDC v. Train, 8 ERC 2120 (D.D.C. 1976); Publication of Toxic Pollutant List, 43 Fed. Reg. 4108, 4109 (1978); 46 Fed. Reg. 2266 (1981); Removal of Dichlorodifluoromethane and Trichlorofluoromethane From the Toxic Pollutant List Under Section 307(a)(1) of the Clean Water Act, 46 Fed. Reg. 10723 (1981). Even so, effluent limitations for the 126 "priority pollutants" chosen by EPA were not completed until 1987, 15 years after the enactment of the Clean Water Act.

\(^{239}\) See CAL. HEALTH & SAFETY CODE § 24.249.8(a) (West 2000). These chemicals, referred to in CAL. LABOR CODE §§ 6382(b)(1) and 6382(d), included carcinogens and reproductive toxicants listed by two highly regarded organizations, the U.S. National Toxicology Program and the U.N. International Agency for Research on Cancer. AFL-CIO v. Duekmejian, 212 Cal. App. 3d 425, 432-433 (1989). This base listing was not established, however, until the Health and Welfare Agency was sued by environmental groups. Id.

\(^{240}\) See CAL. HEALTH & SAFETY CODE § 24.249.8(a) (West 2000).
sets forth three methods under which chemicals may be added: 1) if the state's experts find that "it has been clearly shown" to cause cancer or reproductive toxicity; 2) if a body considered to be "authoritative" by the state agency has formally identified the chemical as causing cancer or reproductive toxicity; or 3) if a California or federal agency has required it to be identified as causing cancer or reproductive toxicity.

Despite the best efforts of the drafters, the listing of chemicals under Proposition 65 has been a stingy process. From the outset, agency officials attempted to limit the scope of Proposition 65's coverage, initially refusing, for example, to list chemicals based on animal testing despite the clear statutory directive to the contrary. The state's "qualified experts" also failed to list any "authoritative" bodies in the early years of the Statute, eventually changing course only after environmental and labor groups brought suit. Even with the adoption of regulations, listing of chemicals has proceeded slowly, with only approximately 50 pesticides, many of which are not heavily used, listed under the Statute in its 14 year history. As a result, the majority of high use toxic pesticides applied today in California are not listed under Proposition 65.

241. CAL. HEALTH & SAFETY CODE § 24.249.8(b) (West 2000).
242. Id. The purpose of the "Authoritative Bodies" listing mechanism is to enable the State to benefit from the accumulated knowledge of other institutions that are recognized as expert in the identification of carcinogens and reproductive toxicants, thus avoiding reinvention of the scientific wheel. See Final Statement of Reasons, 22 CAL. CODE REG., Div. 2 at 4-4. In addition, the authoritative bodies listing mechanism permits the State's appointed experts to focus their work on chemicals not yet thoroughly evaluated. Id. at 4-5, 8.
243. See CAL. HEALTH & SAFETY CODE § 25.249.8(b) (West 2000).
246. This includes approximately 35 pesticides listed as known carcinogens and another 20 listed as reproductive toxicants (with several pesticides listed as both). The list includes a number of comparatively low risk pesticides such as creosote, mineral oil, silica aerogel, and nicotine.
247. These include such widespread toxic chemicals as diazinon, molinate, chlorpyrifos, chloropicrin, sulfuryl fluoride, diuron, paraquat dichloride, simazine, naled, EPTC, dimethoate, and prometryn. In addition, the Proposition 65 listings of the two most heavily used pesticides in California, methyl bromide and metam
The limited number of pesticides listed can be traced to several factors. First, the protective provisions of the Statute do not cover neurotoxic pesticides for which carcinogenic and/or reproductive effects have not been identified. Neurotoxicants are potentially developmental toxicants if they disproportionately or specifically target the developing brain. Unfortunately, most known neurotoxicants have not been studied for developmental toxicity. A second factor derives from the burden placed on agencies to establish that a particular chemical meets the listing criteria under a particular statutory regime. Based on the statutory language that a chemical must be "clearly shown" to be toxic, OEHHA adopted a high standard for listing. This threshold opens the door for industry to introduce voluminous amounts of "conflicting" data, which OEHHA must wade through at the pre-listing stage to determine whether a particular chemical meets the "clearly shown" standard. Ironically, this sodium, may be, for two reasons, less far-reaching than meets the eye. First, as a result of intervention by the agricultural lobby, methyl bromide is listed only as a structural fumigant under the Statute and not for general agricultural use. See Farmers Relieved of Duty to Provide Prop. 65 Warnings, Days Before Deadline, 8 PROP 65 NEWS, Jan. 1994, at 3 (quoting David Roe characterizing OEHHA's decision as "the result of pure political muscle on the part of the ag folks"). Second, since MITC, the immediate break-down product of metam sodium, is not listed under Proposition 65, it is unclear whether the recent listing of metam sodium as a reproductive toxicant has any force and effect under either the Discharge Prohibition or the Warning Requirement.

248. Gina Solomon, pers. comm. The neurotoxicants include the organophosphate and carbamate pesticides.

249. This burden historically has been difficult for agencies to meet. See supra note 238 (describing EPA's experience under Clean Air and Clean Water Act); supra note 194 (describing DPR's failure to list pesticides under TAC program).

250. The legislative history of Proposition 65 indicates that the voters were told chemicals would be listed only if there was "clear and rigorous scientific evidence to the satisfaction of the state's qualified experts." Charles Ivie et al., "Clearly Shown:" An Exacting Standard for Scientific Determination Under Prop. 65: Part II, 11 PROP 65 NEWS, Aug. 1997, at 10-14 (quoting Californians Against Toxic Chemical Hazards, Fact Sheet and California Toxics Initiative 1 (1986), and arguing that the "clearly shown" standard is analogous to the "clear and convincing" standard required under federal law).

251. The high listing threshold allows manufacturers to block potential listings by introducing uncertainty into the risk assessment process and then arguing for the need for more studies. See, e.g., Office of Environmental Health Hazard Assessment, Response to Comments of June 30, 1998 on molinate from Zeneca Ag Products, October 27, 1999 (responding to Zeneca's argument that reproductive and developmental effects of molinate are limited to rodents and not human beings); Letter from Lynn Bergeson et al., representing the Metam Sodium Task Force, to Cynthia Oshita, OEHHA, (Oct. 21, 1997) [urging OEHHA not to list metam sodium as a carcinogen or reproductive toxicant]; Letter from Edward C. Well, Deputy Attorney General, to Christopher Pederson, Altshuler, Berzon, Nussbaum, Berzon & Rubin (Sept. 14, 1999) (on file with author) (responding to inquiry regarding OEHHA's
time and resource consuming process defeats a central statutory purpose of placing the burden of establishing safety on the manufacturer or user.

Notwithstanding the high listing threshold, however, the slow pace of listing pesticides may well be attributed in large part to the charged politics of pesticide regulation in California. During the 1990s, for example, OEHHA devoted substantial resources to prioritizing "candidate" chemicals, including many pesticides, while listing comparatively few under the Statute.252 Furthermore, OEHHA declined to take any action on 65 chemicals—many of them pesticides widely used in California—identified as reproductive toxicants by the EPA as part of their 1994 Toxic Release Inventory ("TRI") until finally spurred to do so by legal action.253 Even with the force of judicial oversight, however, many of the most toxic and widely used TRI pesticides remain unlisted under Proposition 65.254 OEHHA has defended its refusal to adopt the EPA's findings by arguing that the requirements for listing under Proposition 65 differ from EPA's listing criteria.255 To bolster this argument, OEHHA has adopted a narrow definition of "reproductive effect," which differs from EPA's definition by excluding effects on post-natal (after birth) development.256 Based on this narrow reading of the Statute,
OEHHA has refused to list TRI pesticides where it is unclear whether the TRI listing was due to pre or post-natal impacts.257

The political nature of the listing process is hardly surprising, given the regulatory shift that occurs once a chemical is listed. For industry, the listing process provides the single opportunity to debate the wisdom of regulation before the burden shifting provisions of the Statute are triggered and businesses forced to prove that particular chemical exposures or discharges are "safe."258 Listing is also the last point at which the state is able to reassert its traditional power and authority over the regulatory process, before the citizen-friendly provisions of the Statute come into play. Indeed, for certain high profile pesticides, the state has at times appeared ready to forgo listing altogether as a concession to the economic importance of the pesticide use and the uncertainties of "citizen-enforced" regulation under Proposition 65.259 OEHHA's decision to exclude post-natal toxicity to be a central component of reproductive toxicity. See Reproductive and Cancer Hazard Assessment Section, OEHHA, Consideration of Postnatal Exposures in Identification of Reproductive Toxicants, Apr. 7, 1995 ("The definition used by USEPA and others, which includes the effects of postnatal exposures on all aspects of development (not only the reproductive system) is compatible with the Criteria for Recommending Chemicals as 'Known to the State to Cause Reproductive Toxicity' adopted by the DART Identification Committee."); Guidelines for Developmental Toxicity Risk Assessment, 56 Fed. Reg. 63,798-63,826 (1991) (defining "developmental toxicity" as part of reproductive toxicity and including adverse effects from pre- and postnatal exposures.).

257. Standard developmental toxicity testing uses a "continuous breeding protocol" in which exposure continues prior to breeding, during gestation, throughout lactation and after weaning. When adverse impacts fail to occur at birth, but manifest soon thereafter, there is no way to attribute the effects to prenatal vs. postnatal exposures. Because of this ambiguity, OEHHA decided not to list several TRI reproductive toxicants under Proposition 65, including naled, dimethoate, fenoxycarb, and propachlor, based on its inability to determine whether the exposures causing the adverse developmental effects occurred prior to or after birth. Personal Communication with Gina Solomon, Senior Scientist, Natural Resources Defense Council.

258. In contrast, under other statutes, industry may debate the wisdom of proposed risk standards for chemicals even after such chemicals have been listed, thus further delaying the implementation of regulation, often for years. See, e.g., Richard Dahl, A National Proposition 65?, 9 PROP 65 NEWS, Dec. 1995 (describing industry incentives to delay risk assessment under other federal statutes); Applegate, supra note 84, at 312-316 (describing risk assessment delays under Toxic Substances Control Act).

259. At the time of this writing, molinate, a high use pesticide commonly found in air and surface water samples, still has not been listed under Proposition 65 despite the EPA's identification seven years ago of this chemical as a reproductive toxicant. See Addition of Certain Chemicals, 59 Fed. Reg. 1788-1843 (1994). In January 2001, OEHHA found that diazinon, another high use pesticide identified by EPA in 1994 as a reproductive toxicant, did not meet Proposition 65's listing criteria. OEHHA's decision was based on its finding that the EPA's 1994 listing had relied on studies
developmental toxicants from Proposition 65's regulatory scope is a further indication that the regulatory community is still unwilling to fully implement the public's mandate to be protected from toxic chemical exposure. Whether this reluctance to apply the Statute to pesticide use will change in the years ahead will be a primary factor determining the effectiveness of Proposition 65 in combatting pesticide contamination.

b. Proposition 65's Liability Models for Pesticide Pollution

One of Proposition 65's central innovations is its ability to include both pesticide manufacturers and pesticide users within its regulatory scope. This is accomplished through a flexible liability structure that does not distinguish among potential sources of toxic chemicals in allocating liability, but instead reaches any activity causing an unlawful discharge or exposure. The Statute is similar to common law tort in focusing on the end result of a defendant's action regardless of the nature of the originating source. This end-result focus that OEHHA deemed to be outside the EPA administrative record, and thus not reviewable by OEHHA according to the Third District Court of Appeal's holding in Western. Crop Prot. Ass'n v. Davis, 80 Cal. App. 4th 741 (2000). See Office of Environmental Health Hazard Assessment, Candidates for Proposition 65 Listing via the Authoritative Bodies Mechanism Found Not to Meet the Scientific Criteria (22 CCR Section 12306(g): Diazinon (CAS 333-41-5), (2001) (copy on file with author).

260. It is highly doubtful that citizens would have voted to protect themselves from chemicals that cause adverse effects to a developing fetus, but not from chemicals causing similar effects to a nursing infant or developing child.

261. See infra notes 352-356 and accompanying discussion.

262. As discussed, the Proposition 65 regulations, by categorizing workplace exposures as actionable, also create a third category of liability for employers who oversee workplaces in which pesticides are used. See CAL. CODE REGS. tit. 22, § 12601(c) (2001). The standards for communicating Proposition 65 warnings to agricultural workers are controlled by the Pesticides and Worker Safety requirements. CAL. CODE REGS. tit. 3, § 6700 et seq. (2001); CAL. CODE REGS. tit. 22, § 12601(c)(1)(C) (2001). See supra note 95.

263. The Statute exempts from liability sources of contamination traceable to the actions of small businesses, public entities, or operators of public water systems. See CAL. HEALTH & SAFETY CODE § 25,249.11(b) (West 2000).

264. See supra notes 89-91 and accompanying discussion.

265. Proposition 65 and tort law are also distinguishable. The Statute does not, for example, require a showing of actual injury to establish liability either under the discharge prohibition or the warning requirement. Thus, unlike a common law tort action, causation under Proposition 65 is established merely by demonstrating exposure or discharge. The importance and difficulty in proving damages in common law tort actions is illustrated by the Woburn toxics case (the subject of Jonathan Harr's book A CIVIL ACTION (1996)), in which a primary contested issue was whether the toxic chemicals discharged by the defendant companies into drinking water wells were actually the cause of the cancer cluster occurring among children in the neighborhood. See ZYGMUNT J.B. PLATER ET AL., ENVIRONMENTAL LAW AND POLICY:
helps Proposition 65 to avoid some of the difficulties encountered by more conventional pollution statutes with non-point source discharges of hazardous pollutants.\textsuperscript{266}

In an effort to provide some structure to Proposition 65's broad scope, the regulations adopt three different liability models to protect public health, which correspond generally to the common law theories of products liability and nuisance and to the statutory law of occupational exposure.\textsuperscript{267} This article will focus on Proposition 65's liability models based on products liability and nuisance.\textsuperscript{268} Both of these models are relatively unexplored, yet highly relevant to Proposition 65's ability to control non-point source pesticide pollution.

The tort doctrine of strict products liability offers a useful model for the regulation of pesticide manufacturers. Under the product liability model, pesticide manufacturers will be liable if the foreseeable use of their pesticide product leads to unlawful discharges or exposures, regardless of whether they "controlled" the manner or timing of pesticide application. A pesticide manufacturer would also be liable under Proposition 65 even where users failed to follow the explicit labeling instructions—a fact that would normally excuse registrants from any

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\textsuperscript{266} Compare Proposition 65, for example, with the federal Clean Water Act, which prohibits the "discharge" of any pollutant but limits the term "discharge" to "any addition of any pollutant to navigable waters from any point source." 33 U.S.C. § 1362(12) (1994) (emphasis added). The term "point source" is later defined as "any discernible, confined and discrete conveyance . . . ". 33 U.S.C. § 1362(14) (1994); see also 42 U.S.C. §§ 7411(a), 7412(a) (1994) (limiting regulation of hazardous air pollutants to defined stationary sources): infra note 294..


\textsuperscript{268} This Article will not address the occupational exposure liability model since that model is already implemented by state occupational safety and health law. See supra notes 262, 267.
responsibility under FIFRA—where such failure was a foreseeable, though not proper, use of the product.\(^{269}\)

In contrast, for pesticide users the conventional nuisance model is appropriate. Under this model, companies that utilize pesticides will be liable for discharges or releases caused as a result of activities over which they exercise control, either through contractual relationship or land ownership.\(^{270}\) Thus, for example, agricultural users would be potentially liable under Proposition 65 for such standard pesticide pollution as drift from a spraying operation or non-point source water pollution runoff. By focusing on the impact of the discharge rather than the type of source, Proposition 65's nuisance model solves the challenge of non-point source pollution common to pesticide applications.

(1) Pesticide Manufacturer Liability Under Proposition 65

Proposition 65's product liability model derives from the warning requirement, which incorporates traditional consumer product warning requirements.\(^{271}\) Consumer product warnings are unremarkable; other regulatory programs have required such warnings on products as a condition of doing business. By explicitly addressing consumer products, however, Proposition 65 draws commercial manufacturers into its liability scheme, subjecting such companies to a statutory, environmental and public health-based, regulatory framework for the first time. Any doubts about the scope of this requirement were put to rest by American Standard, in which manufacturers of commercial

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\(^{269}\) See infra notes 263-286. See Cal. Food & Agric. Code § 13149 (West 2001) (requiring DPR to determine whether groundwater pollution is due to improper practices or due to the inherent qualities of the pesticide). A defendant still may avoid liability if the injury was caused by a superseding act of a third party. However, where the product "defect" is one of several "concurrent" causes of injury, the manufacturer will still be liable. See Soule v. General Motors Corp., 8 Cal. 4th 548, 573 n.9 (1994).


\(^{271}\) See Cal. Health & Safety Code § 25,249.11(f) (West 2000) (including consumer protection warnings in the definition of a warning). The regulations elaborate on this statutory language by specifically defining a "consumer products exposure" as "an exposure which results from a person's acquisition, purchase, storage, consumption, or other reasonably foreseeable use of a consumer good, or any exposure that results from receiving a consumer service." Cal. Code Regs. tit. 22, § 12601(b) (2001).
plumbing products were found to be in potential violation of the discharge prohibition for selling products that, when used as intended, discharged lead into sources of drinking water.\textsuperscript{272}

The Supreme Court's assumption that manufacturers are potentially liable parties under Proposition 65 generally raised no eyebrows; the regulations already envisioned a product liability model and manufacturers of consumer products had previously been found liable under the Statute.\textsuperscript{273} What was different in this instance were the Supreme Court's holdings that manufacturers could be liable under Proposition 65's discharge provision for introducing products that pollute sources of drinking water into the stream of commerce, and that manufacturers could be liable not only to direct consumers of a product but also to third parties who might be exposed through the foreseeable use of such product. In essence, \textit{American Standard} treats consumer products as mobile "facilities," cast into the stream of commerce but subject to emission or effluent standards similar to those applied to polluting "sources" under the Clean Air or Clean Water Acts. In thus finding a manufacturer liable for selling products that violate environmental regulatory standards—as opposed to causing direct injuries to consumers—\textit{American Standard} is unprecedented in American environmental jurisprudence.\textsuperscript{274}

(a) Products Liability Model

California's strict products liability doctrine offers what is in many ways a highly useful precedent in evaluating consumer product liability under Proposition 65. This is hardly surprising, considering the shared purpose of the two laws: to shift the societal costs of harmful products away from consumers and back to manufacturers, who are in an inherently better position to avoid such risks.\textsuperscript{275} Strict product liability also shares


\textsuperscript{273} These included manufacturers of paint strippers, typewriter correction fluids, paints, solvents, resins, cigars, pipe tobacco, leaded wine glasses, ceramic tableware and nail polish. \textit{See, e.g.}, AG Prop. 65 List.

\textsuperscript{274} The closest analogues are consumer product regulation under the Consumer Product Safety Act, 15 U.S.C. \textsection 2051 \textit{et. seq.} (1994) and the Federal Food, Drug and Cosmetic Act, 21 U.S.C. \textsection 301 \textit{et. seq.} (1994). These federal statutes do not regulate releases of chemicals, however, but instead set product standards that must be met in the manufacturing process.

\textsuperscript{275} Compare, for example, a central purpose behind the development of strict product liability—"to insure that the costs of injuries resulting from defective products are borne by the manufacturers that put such products on the market rather than by the injured persons who are powerless to protect themselves,"
Proposition 65's market-driven approach to improving product safety. Both laws achieve these goals by relieving the plaintiff of some of the onerous burdens imposed by less protective laws such as negligence or command and control environmental statutes. As a result, many businesses—in some cases entire industries—have moved to safer products, with fewer toxic inputs.

Under the product liability model, manufacturers of commercial products, including pesticides, may also be liable for unlawful discharges or exposures. Strict products liability imposes liability based on a "defendant's participatory connection, for his personal profit or other benefit, with the injury-producing product and with the enterprise that created consumer demand for and reliance upon the product." In order for product liability to attach, a plaintiff must establish that the product was defective and that the "defect" proximately caused the plaintiff's injury. Product liability under Proposition 65 is best analogized to product liability actions based on "design defects," in which products create unlawful discharges or

Greenman v. Yuba Power Products, Inc., 59 Cal. 2d 57 (1963) — with Section 1 of Proposition 65's preamble, in which the "people of California find that hazardous chemicals pose a serious threat to their health and well-being, that state government agencies have failed to provide them with adequate protection" (emphasis added). The people's belief that, with respect to toxics, they were powerless in the face of unaccountable corporations, leads to Section 1(d) of the Preamble, in which the people declare their rights to "shift the cost" of hazardous waste reduction and cleanup "more onto offenders and less onto law-abiding taxpayers." 

276. See Roe, supra note 30; Mancuso v. S. Cal. Edison Co., 232 Cal. App. 3d 88, 98 (1991). An additional reason justifying strict product liability is to spread the risk of loss among all who use the product. See id. at 98. This policy could have some application to the manner in which the discharge prohibition could be said to place especially strict restrictions in order to guarantee the safety of water sources for particular problem areas. This policy would not apply, however, to the warning requirement due to the overwarning effect. See Rechtschaffen, supra note 34, at 355-58.

277. In addition to eliminating the requirement that plaintiffs show negligence, strict products liability places the burden of proof on the defendants. Once a plaintiff makes a prima facie showing that the injury was proximately caused by the product's design, to show that a product is not defective under the risk-benefit test. Campbell v. General Motors Corp., 32 Cal. 3d 112, 119 (1982); Barker v. Lull Engineering Co., 20 Cal. 3d 413, 431-432 (1978).

278. See infra notes 485-487 and accompanying discussion.


280. See, e.g., Barker, 20 Cal. 3d at 427; Cronin v. J.B.E. Olsen Corp., 8 Cal. 3d 121, 133-34 (1972).

281. There are two basic types of defects under strict products liability law: defects due to accidents or irregularities in the manufacturing process, known as
exposures as a natural consequence of their design and marketing strategy.\textsuperscript{282} Pesticide products are thus "defective" in design under Proposition 65 if they cause unlawful discharges, or exposures to persons without warning, when used in a reasonably foreseeable manner.\textsuperscript{283}

Under strict product liability law, the "foreseeable" use of a product is a broader standard than its "intended" use.\textsuperscript{284} The Proposition 65 regulations adopt this common law approach, defining a "consumer product exposure" as one that results from a "reasonably foreseeable use of a consumer good, or any exposure that results from receiving a consumer service."\textsuperscript{285} The

"manufacturing defects," and defects inherent in the design of the product, known as "design defects." In general, a manufacturing defect is readily identifiable as a product that differs from the manufacturer's intended result or from other identical units of the same product line. Barker, 20 Cal. 3d at 429; see also Lewis v. Am. Hoist & Derrick Co., 20 Cal. App. 3d 570, 580 (1971) (holding that when a product comes off the assembly line in a substandard condition, it has incurred a manufacturing defect). In contrast, a "design defect" cannot be identified by simply comparing the injury producing product with other "normal" units. Instead, a product will be defective in design if it failed to perform as safely as an ordinary consumer would expect when used in a reasonably foreseeable manner (this is referred to as the consumer expectation test), or if the risk of danger inherent in the challenged design outweighs the benefits of such design (referred to as the risk-benefit test). See, e.g., Barker, 20 Cal. 3d at 429-30.

282. The plumbing components in People ex. rel. Lungren v. Super. Ct. (Am. Standard, Inc.), 14 Cal. 4th 294 (1996), provide a good example of a design defect. The components were defective because they leached lead as a natural consequence of their designed leaded brass content. In contrast, a "manufacturing defect" under Proposition 65 would result from a particular batch of a product with an unintended defect—individual food products containing unusually high levels of a toxic chemical, for example—that caused damages.

283. See CAL. HEALTH & SAFETY CODE §§ 25,249.5, 25,249.6 (West 2000); CAL. CODE REGS. tit. 22, § 12601(b) (2001); Barker, 20 Cal. 3d at 429. Similar to Proposition 65, a "warning defect" case under strict product liability law requires the plaintiff to show that the defendant had actual or constructive knowledge of the product danger. See, e.g., Carlin v. Super. Ct., 13 Cal. 4th 1104, 1117 (holding that, unlike strict liability for design defects, failure to warn strict liability does not subject manufacturers to liability for flaws in their products they have not, and could not have, discovered); Anderson v. Owens-Corning Fiberglass Corp., 53 Cal. 3d 987, 994-95 (1991). Products that are "defective" for causing unlawful discharges are likewise similar to products with straightforward design defects: the presence or absence of a warning does not determine liability. Hansen v. Sunnyside Prods., Inc., 55 Cal. App. 4th 1487, 1517 (1997). Proposition 65's discharge prohibition differs from products liability law for design defects, however, since it requires actual or constructive knowledge on the part of the manufacturer to establish liability. See id. at 1517-18 (noting that actual or constructive knowledge on the part of the manufacturer is not required to establish liability for a pure design defect).

284. See, e.g., Cronin, 8 Cal. 3d at 126; Barker, 20 Cal. 3d at 426 n.9 ("design and manufacture of products should not be carried out in an industrial vacuum but with the recognition of the realities of their everyday use").

285. CAL. CODE REGS. tit. 22, § 12601(b) (2001). The term "consumer products exposure" is intended to have "broad application," applying to both standard
Statement of Reasons clarifies that this provision was not meant to be limited to reasonably "intended" exposures, but rather any exposures that might be "anticipated." A "knowing" discharge or exposure under the product liability model thus refers to the manufacturer's constructive knowledge of how a product will be used once it is released into the marketplace. If the use of a product was foreseeable, standard causation analysis, utilizing the "substantial factor" test, determines liability.

From a regulatory perspective, pesticides are different from most pollutants, since they are manufactured as toxins to be intentionally introduced into the physical environment. In this arena, Proposition 65's product liability model is well designed to fill the jurisdictional regulatory void over pesticide manufacturer activity left open by the command and control statutes. In so applying strict regulatory standards to pesticide products, Proposition 65 accomplishes what no other statute, including FIFRA, is able to achieve.

(2) Pesticide User Liability under Proposition 65


288. See Soule v. General Motors Corp., 8 Cal. 4th 548, 572-73, 573 n.10 (1994). The substantial factor test states that if a plaintiff's injuries would not have occurred in the absence of the product defect, such defect will typically be considered a substantial contributing factor. See id.; Doupnik v. General Motors Corp., 225 Cal. App. 3d 849, 860-64 (1990); see also Self v. General Motors Corp., 42 Cal. App. 3d 1, 10 (1974) (holding that the defendant was entitled to a jury instruction that the placement of a fuel tank in the plaintiff's vehicle could not have been a substantial factor in causing plaintiff's injuries if such injuries would have occurred as a result of the accident no matter where the fuel tank was located). A defendant may still avoid liability if the injury was caused by a superseding act of a third party. Soule, 8 Cal. 4th at 573 n.9; see also Doupnik, 225 Cal. App. 3d at 863 (holding that the intervening negligent act of a third party is not a superseding cause where the act was a normal response to the defendant's conduct and was not extraordinarily negligent). However, where the product "defect" is one of several "concurrent" causes of injury, the manufacturer will still be liable. The doctrine of "concurrent causes" holds that when two or more tortious acts combine, each contributing significantly to a single ultimate harm, each act is deemed a substantial and legal cause of injury, making each concurrent tortfeasor fully liable. See Soule, 8 Cal. 4th at 573 n.9; 6 B.E. WITKIN, SUMMARY OF CALIFORNIA LAW § 970 (9th ed. 1988); see also Rutherford v. Owens-Illinois, Inc., 16 Cal. 4th 953, 976-77 (1997) (holding that a plaintiff may prove concurrent causation in asbestos cases by showing that exposure to a defendant's product substantially contributed to the aggregate dose of asbestos to which the plaintiff was exposed).
statutory nuisance laws that impose liability on those whose activities unreasonably interfere with the interests of third parties.\textsuperscript{289} Under these doctrines, a defendant will be liable for a hazard arising from a use of property if the defendant exercised some degree of "control" over the activity giving rise to the hazard.\textsuperscript{290} The scope of this liability includes activities that a defendant had the ability to control, whether or not such control was actually exercised.\textsuperscript{291} Proposition 65's nuisance model likewise bases liability on a business's ability to "control"
activities giving rise to an unlawful discharge or exposure. Under Proposition 65's nuisance model, pesticide users will be liable for pesticide applications that lead to unlawful discharges or exposures to the extent they exercised "control" over the application activity, either through control of the land on which the pesticide was applied or through control of the activity itself.

The nuisance liability model encompasses all sources of toxic release under the common control of a single business. As discussed above, Proposition 65 is not concerned with the source of a discharge or exposure, but instead with the end destination of the released toxic chemical. This approach is in sharp contrast to more traditional command and control environmental statutes which address the ultimate impact of emissions only indirectly. Such statutes define the contours of a regulated "facility" or mandate specific effluent limitations from particular discharge points such as a sewage pipe or a smoke stack, but if a party is in compliance with its discharge permit,
the potential damage caused does not give rise to liability.\footnote{295}
Under these statutes, how one measures "discharge" is thus crucial since it determines compliance with the operating permit.

In contrast, in a Proposition 65 exposure case, the relevant measurement is the ultimate daily exposure of toxic chemicals to an individual.\footnote{296} Similarly, in a Proposition 65 discharge case, as discussed above, the relevant measurement is the daily "amount" of toxic chemical that "enters a source of drinking water."\footnote{297} Which smokestack or which discharge pipe emitted the toxic chemical is essentially irrelevant, so long as they all fall under the "control" of the same party.\footnote{298} As discussed in the next section, this aspect of Proposition 65 is key to its ability to navigate through the non-point pollution sources characteristic of pesticide drift and runoff.

(3) Comparison Between Pesticide Manufacturer and Pesticide Use Liability Under Proposition 65

Proposition 65's consumer product model and its nuisance model differ in how they allocate liability to a business activity. As discussed, a business violates Proposition 65 under the consumer product model of liability by introducing into the stream of commerce a product that, when used in a foreseeable manner, discharges a toxic chemical into a source of drinking water or exposes persons to a toxic chemical without any warning.\footnote{299} Under the consumer product model, a defendant's

\footnote{295}{See 33 U.S.C \textsection 1342(k) (1994) (stating that compliance with NPDES or SPDES permit constitutes compliance with Section 301 of the Clean Water Act for purposes of enforcement); E. I. du Pont de Nemours & Co. v. Train, 430 U.S. 112, 138 n.28 (1977) ("The purpose of \{Section 402(k)\} seems to be . . . to relieve \{permit holders\} of having to litigate in an enforcement action the question of whether their permits are sufficiently strict"); Atlantic States Legal Foundation v. Eastman Kodak, 12 F.3d 353, 357-358 (2d Cir. 1993) (holding that the shield provision of Clean Water Act applies even to pollutants not listed on NPDES permit).
\footnote{296}{See CAL. HEALTH \& SAFETY CODE \textsection 25,249.6 (West 2000).
\footnote{297}{CAL. HEALTH \& SAFETY CODE \textsection 25,249.9(b)(1) (West 2000).
\footnote{298}{Numerous Proposition 65 enforcement cases have been brought alleging environmental exposures from stationary sources. See, AG Prop. 65 List, \textit{supra} note 17 (listing enforcement cases); Statement of Reasons for 22 Cal. Code Reg. \textsection 12601, at 40 ("environmental exposures can result from the . . . operation of a chemical production or manufacturing facility.").
\footnote{299}{See \textit{supra} notes 262-298 and accompanying discussion.}
liability arises from its profit-oriented, participatory connection with the defective product and the enterprise that created consumer demand and reliance.\textsuperscript{300} A manufacturer of a consumer product that discharges or exposes persons to a toxic chemical need not "control" the activity that gives rise to a violation, since the introduction into commerce—the "creation" of the product defect—is sufficient to warrant liability.\textsuperscript{301} Conversely, under Proposition 65, retail businesses in the chain of commerce that may have some "control" over the sale of a product, but which have not played a significant role in the creation or marketing of the product itself, will not be liable.\textsuperscript{302}

Under the nuisance model, the opposite is true.\textsuperscript{303} Nuisance liability does not turn on which party "created" the nuisance-like condition, but rather on which party "controlled" the activity directly giving rise to the offending nuisance. The California Supreme Court noted this distinction in \textit{Preston v. Goldman} when it ruled that prior landowners could not be held responsible for dangerous conditions they may have created on the property in the past, but over which they no longer had any control:

Despite plaintiff's attempts here to distinguish his case as one in which the liability alleged is not based upon the [defendant's] status as landowners but rather as the creators of a negligent condition, this analysis does not bear up under scrutiny. While principles regarding negligence in manufacturing chattels [cite] have in some instances been extended to negligent conditions on land, there has been no wholesale importation of one set of rules to the other context. Instead, the general rule on nonliability has been applied to conditions on the land created by the predecessor landowner.

\textsuperscript{301} See People ex. rel. Lungren v. Super. Ct. (Am. Standard, Inc.), 14 Cal. 4th 294, 306 (1996) (holding that manufacturers are potentially liable under Proposition 65, even though they have no control over plumbing products after they are sold); see also Yanase v. Automobile Club of So. Cal., 212 Cal. App. 3d 468, 477 (1989) ("Involvement in the chain of commerce, as distinguished from the concept of control of the premises, is fundamental to the concept of products liability."); Fortman v. Hemco, 211 Cal. App. 3d 241, 251-52, 254 (1989) (if one is part of the overall production and marketing enterprise, he may not escape liability by arguing he had no control over the defect); Hansen v. Sunnyside Products Inc., 55 Cal. App. 4th 1497, 1516 [jury's focus in a product liability case is "properly directed to the condition of the product itself, and not to the reasonableness of the manufacturer's conduct"] (quoting Barker v. Lull Engineering Co., 20 Cal. 3d 413, 434 (1978)).
\textsuperscript{302} See, e.g., \textit{CAL. HEALTH & SAFETY CODE} § 25.249.11(f) (West 2000) (stating that a retail seller is not obligated to provide warning except where the retail seller itself is responsible for introducing a listed chemical into the consumer product in question).
\textsuperscript{303} See supra notes 128--131 and accompanying discussion.
with the landowner's role as "creator" taking a secondary place.\textsuperscript{304}

Applying the nuisance model to exposures arising from consumer products is based on the faulty assumption that manufacturers are liable for exposures to product consumers but not for "environmental exposures" to third parties. This approach, however, is unsupported by the regulations, which do not limit "consumer product" exposures to consumers or preclude manufacturers from liability for "environmental" exposures caused through the sale of their products.\textsuperscript{305} As evidenced by the American Standard decision, product liability under the discharge prohibition clearly may arise for "environmental" type discharges, without regard to whom is ultimately "exposed" to the contaminated drinking water source.\textsuperscript{306} Further support for a blanket standard based on exposure is provided by common products liability law, which,

\begin{itemize}
\item \textsuperscript{304} Preston v. Goldman, 42 Cal. 3d 108, 117 (1986) (emphasis added). Other cases have followed this distinction, noting that a nuisance claim may not lie for damages due to a defective product. City of San Diego v. United States Gypsum Co., 30 Cal. App. 4th 575, 585-586 (1994) (refusing to allow a nuisance claim against asbestos manufacturer for injuries due to asbestos-containing building materials); Town of Hookset Sch. Dist. v. W.R. Grace Co., 617 F. Supp. 126, 133 (D.N.H. 1984) (holding that a defendant's acts as a manufacturer, as opposed to a property owner, cannot establish a nuisance action). Two other cases involving past hazardous waste releases have held businesses potentially liable for "nuisances" on property they no longer controlled. See Selma Pressure Treating Co., Inc. v. Osmose Wood Preserving Co. of Am., Inc., 221 Cal. App. 3d 1601, 1619, n.7 (1990) (holding that equipment suppliers and installers were liable for creating a nuisance of hazardous waste spillage on property they did not own or control); Mangini v. Aerojet-General Corp. 230 Cal. App. 3d 1125, 1137 (1991) (holding that prior tenants may be liable for creating a continuing nuisance of hazardous waste on a property, even after they no longer had a possessory interest in the property). Gypsum distinguished both Mangini and Selma Pressure by noting that these cases had simply held defendants liable for creating a nuisance, which could be considered continuing into the present, at some time in the past. Gypsum, 30 Cal. App. 4th at 586-587. This approach is also consistent with federal and state hazardous waste laws that subject prior landowners and operators to present liability for hazardous waste cleanup. See, e.g., 42 U.S.C. § 9601 et. seq [1994].
\item \textsuperscript{305} An "environmental exposure" results from "contact with an environmental medium, including, but not limited to ambient air, indoor air, drinking water, standing water, running water, soil, vegetation, or manmade or natural substances, either through inhalation, ingestion, skin contact or otherwise." CAL. CODE REGS. tit. 22, § 12601(d) (2001). Since third parties are not product "consumers," see CAL. CODE REGS. tit. 22, § 12601(b) (2001), exposures to third parties are more appropriately characterized as "environmental exposures."
\item \textsuperscript{306} One may assume that the "consumers" of the brass plumbing products at issue in Am. Standard were largely home builders or plumbers, rather than residential homeowners. The consumer or third party exposure analysis in this case is arguably dicta, since the discharge provision protects "sources of drinking water" for all California citizens.
\end{itemize}
while understandably focusing on injuries to consumers, also holds manufacturers liable for injuries to third parties caused by use of their products.\textsuperscript{307}

The nuisance model, when used alone, allows manufacturers to escape liability for discharges or exposures since manufacturers never control the uses to which their products are put, including those that violate Proposition 65. Exclusive application of the nuisance model to manufacturers would defeat a central purpose of the Statute—to inform citizens when they are being exposed to toxic chemicals.\textsuperscript{308} The statutory structure of Proposition 65 justifiably assumes that the manufacturer possesses the most complete knowledge of the dangers of its products. By relieving a manufacturer of its warning obligations, the nuisance model would create a potential loophole in the chain of liability. In short, the party with the best access to relevant product information (the manufacturer) would be under no duty to disseminate it so long as the “exposures” are to third parties and not the product consumer and user. Since product users would be left uninformed, they likewise would be under no duty to provide warnings to third parties.\textsuperscript{309}

In contrast to the nuisance model, the consumer product model requires that manufacturers bear responsibility for the toxic emissions caused by the foreseeable uses of their products once they are released into commerce. In an exposure case, depending upon the circumstances, manufacturers may fulfill their obligation by providing warnings to users of their

\begin{itemize}
\item \textsuperscript{307} Barret v. Super. Ct., 222 Cal. App. 3d 1176, 1187 (1990); Elmore v. Am. Motors Corp. 70 Cal. 2d 578, 586 (1969) (holding that manufacturers are liable for injuries caused by their defective products not only to the purchaser or user of such product, but also to injured bystanders as well).
\item \textsuperscript{308} The Statute preamble declares the people’s right “to be informed about exposures to chemicals that cause cancer, birth defects or other reproductive harm.” The ballot argument in favor of Proposition 65 states: “Proposition 65 also tells businesses: Don’t expose us to any [listed] chemicals without first giving us a clear warning. We each have a right to know, and to make our own choices about being exposed to these chemicals.” Reiner, Torres & Newman, supra note 7. See also Rechtschaffen, supra note 34, at 318-19.
\item \textsuperscript{309} Proposition 65's “knowing and intentional” requirement includes constructive knowledge of generally known and accepted scientific facts. See supra notes 18-20 and accompanying discussion; see also Anderson v. Owens-Corning Fiberglass Corp., 53 Cal. 3d 987, 995-96 (1991) (holding that a “failure to warn defect” includes risks of which defendant should have been aware given the generally recognized and available scientific knowledge). Despite the constructive knowledge standard, however, it is easy to imagine many situations in which a facility operator will have significantly less information than the manufacturer regarding the potential toxic emissions from consumer products used at its facility.
\end{itemize}
products,\textsuperscript{310} or to potentially affected third parties through newspaper publications or other widespread media methods.\textsuperscript{311} Requiring manufacturers to comply with Proposition 65's provisions regarding third party exposures fulfills a corollary purpose, to compel manufacturers to move away from products that expose persons to toxic chemicals. Clearly this is true for potential violations of the discharge prohibition, since manufacturers must reformulate their products if they wish to continue to do business in California. Perhaps not surprisingly, the warning requirement can likewise effect such a change by providing consumers with information regarding toxic and non-toxic products, thereby subjecting manufacturers to various public pressures to reduce toxic exposures.\textsuperscript{312}

c. Application of Proposition 65 to Pesticide Pollution

The two main areas of pesticide pollution are discharges of pesticide runoff into surface and/or ground water, and pesticide drift from aerial spraying.\textsuperscript{313} Proposition 65 would apply to each of these types of pollution in different ways.

(1) Application of Proposition 65's Discharge Prohibition to Pesticide Contamination

Proposition 65's discharge prohibition forbids releases of toxic chemicals into sources of drinking water. As discussed above, for risk assessment purposes the measurement of the "amount" of pesticide "discharged" is made at the point where

\textsuperscript{310} Product liability law allows manufacturers to provide warnings to an intermediary consumer or user that may be in a better position to disseminate information to third parties regarding the risks of a particular product. See, e.g., Brown v. Super. Ct., 44 Cal. 3d 1049, 1061-62 (1988), (holding that a manufacturer's duty to warn of risks from prescription drugs runs to the physician, not to the patient); see also Carlin v. Super. Ct., 13 Cal. 4th 1104, 1116 (1996); Groll v. Shell Oil Co., 148 Cal. App. 3d 444, 449 (1983); Carmichael v. Reitz, 17 Cal. App. 3d 958, 994 (1971). As an example, in the diesel facility cases the manufacturers could have provided warnings to alert operators that their facilities might have to make certain operational changes to avoid unlawful environmental exposures, or otherwise alert neighboring communities, in compliance with Proposition 65.


\textsuperscript{312} See Barsa, supra note 237. Barsa quotes the California EPA's Proposition 65 Review Panel's Summary of Issues, which stated that "Proposition 65's principal success has been in the altering of behavior by industry in the area of source reduction," and that "Proposition 65 has compelled businesses to know more about their products and has generally resulted in an increase in industry's preventative behavior." Id. at 1242 n.118; see also Dennis Pfaff, "Revolution" is Seen in Toxic Exposures, 12 PROP 65 NEWS, Sept. 1998, at 20.

\textsuperscript{313} See supra notes 197, 202-203, 206.
the pesticide enters into a source of drinking water. By focusing on the "amount" discharged, and not the ultimate concentration of the pesticide in the water body, Proposition 65 applies a significantly stricter measurement standard than those of other statutes protecting water resources.

In California, pesticide discharge to sources of drinking water, which include most surface water and ground water resources in the State, is relatively common. Pesticide discharges into streams and rivers located in the Central Valley, for example, are regularly detected where appropriate monitoring is conducted. In similar fashion, detections of pesticides in groundwater in California have been reported in numerous instances. Typically, groundwater contamination is detected as a pesticide concentration in the groundwater reservoir. Such a detection may not provide immediate information as to the source or nature of the discharge. To establish manufacturer liability, a plaintiff may potentially overcome this causation challenge by tracing the chemical formula of the pesticide to the

314. See supra notes 59-71 and accompanying discussion.
315. As discussed, FIFRA adopts a cost-benefit analysis in determining whether pesticidal impacts on surface water are "unreasonable." See supra notes 96-100. The SDWA requires public water systems to implement treatment technologies to control certain listed toxic contaminants, but does not regulate individual dischargers. Finally, under the Clean Water Act, TMDLs are established at a level necessary to implement applicable water quality standards (including a margin of safety to account for uncertainty), but only on a chemical-by-chemical basis. Thus, where the diluted level of a pesticide in water is not itself considered to be toxic, no TMDL will be required, even if such surface water contains multiple contaminants. See Central Valley Regional Water Quality Control Board, Staff Report: Explanation of Recommended Changes for 1998 Clean Water Act Section 303(d) List 5 (1998) (recommending removal of carbofuran, malathion, and methyl parathion from a list of impairment contaminants since concentrations of these pesticides in the Sacramento River had not exceeded available criteria). In contrast, Proposition 65's discharge provision, by not allowing for such dilution, addresses the aggregate presence of other contaminants in the water body.
317. See Heavner, supra note 169, at 39; Keegley et al., supra note 150, at 39-44. See supra note 202. Monitoring surface water discharges is made easier by the regular pulses of pesticide runoff that drain from the same applications every year. See, e.g., S.Y. Panshin, J.L. Domagalski & N.M. Dubrovsky, Pesticide Concentrations in Surface Water as a Function of Agricultural Land Use in Five Small Watersheds, Western San Joaquin Valley, California, 75 Eos: Transactions of the Am. Geophysical Union (Supp.) 246 (1994) (showing a correlation between agricultural application and pesticide detections).
318. See Heavner, supra note 159, at 11-15. The California current use pesticides most frequently detected in groundwater are simazine, diuron, atrazine, and methyl bromide, in addition to degradation products ACET, Deethyl atrazine, TPA, and DACT. Id. at 11.
registrant of the pesticide. For users and/or applicators, discovery into local hydrology and local pesticide uses will likely reveal the potential sources of the contamination. At that point, each user/applicator utilizing the detected pesticide within the groundwater watershed could be found jointly and severally liable under common law theories of shared or alternate liability.

The establishment of the daily “amount” of listed chemical discharged into the source of drinking water is a potentially greater proof challenge, particularly for groundwater contamination, which is normally caused by slow subsurface leaching at a rate that is difficult to monitor. The drafters of Proposition 65 anticipated this problem by adding language in Section 25249.5 that prohibits discharges “onto or into land where such chemical passes or probably will pass into any source of drinking water.” The regulations clarify that such discharges include aerial spraying of pesticides that immediately will be deposited on land. Finally, the Proposition 65 regulations allow a plaintiff to use accepted methods of modeling to establish that a discharge into or onto land will probably pass into a drinking water source.

Under this language, a plaintiff theoretically would not need to detect actual pesticide contamination of a drinking water source, but instead merely the fact of a pesticide release onto land or into air, and the “probability” of potential

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319. Under the Pesticide Contamination Prevention Act, DPR is required to determine whether the contamination was caused by proper or improper application techniques. See CAL. FOOD & AGRIC. CODE § 13149 (West 2001). If DPR finds that contamination was due to proper application, the pesticide manufacturer is liable under the product liability model. If the pesticide application is found to have been improper, a factual question would remain as to whether the manner of pesticide use was nonetheless “foreseeable.” See supra notes 284-287 and accompanying discussion.

320. See Rutherford v. Owens-Illinois, Inc., 16 Cal. 4th 953, 968-977 (1997); Summers v. Tice, 33 Cal. 2d 80, 84-87 (1948). The degree to which these theories could be applied would depend on whether a plaintiff could establish that each application contributed at least some part to the overall groundwater contamination.

321. CAL. HEALTH & SAFETY CODE § 25,249.5 (West 2000). Under the regulations, “probably will pass” is defined as “more likely than not will pass.” CAL. CODE REGS. tit. 22, § 12201(e)(2) (2001). The Statement of Reasons explains that this definition was derived from the preponderance of the evidence standard generally used in civil litigation. Statement of Reasons, CAL. CODE REGS. tit. 22, § 12201 Amendment, at 4.

322. CAL. CODE REGS. tit. 22, § 12401(e)(3) (2001) (“Discharge or release into water or onto or into land” includes a “discharge or release to air that is directly and immediately deposited into water or onto land.”).

contamination. Faced with this possibility, the agricultural industry successfully lobbied the State to pass a regulation establishing that a proper application of a pesticide not considered to be a groundwater contaminant shall be presumed not to pass into a source of drinking water. Thus, for a subset of pesticides, a plaintiff in a Proposition 65 action must still establish that a source of drinking water has actually been contaminated. The Proposition 65 Ballot is clear, however, that agriculture was not meant to be granted exemptions under the Statute. Thus, the regulatory Statement of Reasons confirms that once such contamination has been detected, the presumption that a particular pesticide will not migrate into a source of drinking water is no longer available.

(2) Application of Proposition 65's Warning Requirement to Pesticide Contamination

Proposition 65's warning requirement applies to any exposure of an individual to a listed chemical. Exposures may be

324. Thus, with appropriate models in place, a plaintiff could make its case by simply comparing local pesticide use patterns with pesticide detections in ground or surface water.

325. CAL. CODE REGS. tit. 22, § 12405 (2001). In order to qualify for this exemption, a pesticide must have met all data requirements not been found to be a likely groundwater contaminant under the Pesticide Contamination Act. The is because "an economic poison which has been studied under the Pesticide Contamination Prevention Act (PCPA) and not been placed on the Groundwater Protection List established under the PCPA will probably not migrate to groundwater." Statement of Reasons, Section 12405 at 4.

326. A plaintiff can use modeling to extrapolate the daily "amount" discharged, based on a detectable concentration of a pesticide in a groundwater body, given additional information regarding the identity of users and the frequency of such uses. See CAL. CODE REGS. tit. 22, § 12901(1) (2001).

327. Arthur C. Upton, Norman W. Freestone & Albert H. Gersten, Rebuttal to Argument Against Proposition 65, CALIFORNIA BALLOT PAMPHLET: GENERAL ELECTION 55 (Nov. 4, 1986) ("Proposition 65 treats farmers exactly the same as everyone else - no tougher, no easier.")

328. Statement of Reasons, CAL. CODE REGS. tit. 22, § 12405, at 4, 6 (stating that if the chemical in question has "passed" into a source of drinking water, this regulation does not apply; the agency revised an earlier version to clarify that "it expressly relates only to the question of whether a discharge or release 'probably will pass' to a source of drinking water"); see id. at 9 ("The presumption . . . applies only where there is a suspicion that a chemical will pass into a source of drinking water, not where is actually has passed.") (emphasis added). Indeed, a review of the entire Statement of Reasons for the final version of CAL. CODE REGS. tit. 22, § 12405 demonstrates the intent of the drafters was to preclude liability for agricultural users based on the "mistaken" premise that "any discharge of a chemical onto the ground will always result in a significant amount of a listed chemical reaching a ground-based source of drinking water." Id. at 8 (emphasis added).
through air, food products, drinking water, \textsuperscript{329} dermal exposure and, especially for babies or infants, oral exposures caused by mouthing behavior after coming into contact with contaminated dust or soil particles. \textsuperscript{330} In areas of California with heavy pesticide use, cumulative exposures to residents through each of these mediums are common. \textsuperscript{331}

The most typical exposure requiring a warning would be from aerial pesticide drift. \textsuperscript{332} Where monitoring has occurred in California, pesticides have been routinely detected in air samples, often miles away from their source. \textsuperscript{333} Despite these detections, however, current regulatory enforcement of pesticide air pollution is largely non-existent. \textsuperscript{334} The application of Proposition 65's Warning Requirement has the potential to change that situation.

329. The preventative standards of the discharge prohibition typically would moot the need for a warning under Proposition 65, since any contamination to drinking water that would require a warning would already be prohibited under the discharge prohibition. As an example, consider a daily discharge of 50 micrograms of a listed substance into a source of drinking water. To measure liability, the discharge prohibition assumes that an individual will be exposed to that amount \textit{in drinking water}, even where the actual exposure may be only a fraction of that total. This analysis could change to the extent the drinking water exposure was part of a cumulative, multi-media exposure from a common source.

330. WALLINGA, supra note 106, at 14-15; GINA M. SOLOMON & LAWRIE MOTT, NATURAL RESOURCES DEFENSE COUNCIL, TROUBLE ON THE FARM: GROWING UP WITH PESTICIDES IN AGRICULTURAL COMMUNITIES, 14-16 (1998), available at http://www.nrdc.org/health/kids/farm/farminx.asp. To the extent exposures from different media emanate from a single source of contamination, they may be considered cumulatively.

331. See, e.g., SOLOMON, supra note 330, at 11-16; Nancy J. Simcox et al., Pesticides in Household Dust and Soil: Exposure Pathways for Children of Agricultural Families, 103 ENVTL. HEALTH PERSP. 1126 (1995). To prove an exposure under Proposition 65, a plaintiff must use an accepted "method of analysis" to detect a pesticide in a medium of exposure (such as air or water or household dust). The Proposition 65 regulations assume that an individual will be exposed to a certain daily amount of common environmental media such as air or water. For other media of exposure such as dust, soil, or clothing, a plaintiff would have to establish the "amount" of exposure by proving through an accepted scientific method the daily rate of an individual to these media. A plaintiff's burden in establishing exposures through such relatively unconventional routes can be difficult to meet, especially when there is no generally accepted "method of analysis" to measure predicted exposures. See CAL. CODE REGS. tit. 22, § 12901(f) (2001); supra notes 24-26 and accompanying discussion.


333. See supra note 197; Clifford P. Rice & Sergei M. Chernyak, Marine Arctic Fog: An Accumulator of Currently Used Pesticide, 35 CHEMOSPHERE 867 (1997).

334. Aerial drift of pesticides has been largely neglected due to the lack of comprehensive monitoring and DPR's failure to list any actively used pesticides as Toxic Air Contaminants under the TAC program. See supra notes 194, 197 and accompanying discussion.
Under Proposition 65, once monitoring has detected pesticides in ambient air, a plaintiff may rely on standard air modeling techniques, used by state agencies such as the Air Resources Board, to create an isopleth plume of airborne contaminants. From this air contaminant model, a plaintiff may estimate how many persons have been exposed and the extent of the corresponding warning requirement. As noted by several commentators, the key to effective warnings under Proposition 65 is the degree of information actually conveyed by such warnings. This may be a concern for the pesticide industry, which prefers secrecy regarding both the chemical contents of its pesticide products and the timing of pesticide applications in the field. To be effective, however, a warning should identify the pesticide being used, the identity of the business or businesses responsible for such exposure, and the nature of the pesticide's toxicity. Moreover, pesticide users should be required to disclose the timing of their applications to allow the public to avoid such toxic exposures should it choose to do so.

In contrast to pesticide discharges into drinking water sources, pesticide releases into air and other media are permitted under Proposition 65, as long as a warning is given to those persons exposed. However, the negative publicity associated with providing a warning will in many situations achieve the same result as a prohibition. It is likely that a strongly worded warning combined with information on the timing of the application would create widespread public opposition to aerial spraying of toxic pesticides. Pesticide users wishing to avoid alerting local residents that they are being

335. CAL. CODE REGS. tit. 22, § 12901(f) (2001); see, e.g., James A. Westbrook, Air Dispersion Models: Tools to Assess Impacts from Pollution Sources, NAT. RESOURCES & ENV'T 546, 549 ("most Proposition 65 exposure analyses follow standard EPA and/or California modeling guidance").

336. See, e.g., Rechtschaffen, supra note 34, at 320-67; Barsa, supra note 236.

337. See, e.g., 7 U.S.C. § 136h (1994) (addressing "protection of trade secrets and other information"). Currently there is no requirement that pesticide users provide any notice to nearby residents of a pesticide application. Randy Segawa, DPR, personal communication.

338. This fact has been noted by several commentators. See, e.g., Rechtschaffen, supra note 34, at 341-55; Barsa, supra note 236.

339. Proposition 65 warnings are not preempted by FIFRA's uniform labeling requirements for pesticide products, so long as the warnings are not required as part of labeling. See Chemical Specialties Manufacturers Association, Inc. v. Allenby, 958 F.2d 941, 945-949 (9th Cir. 1992). Manufacturer and user warnings for environmental exposures to pesticides under Proposition 65 are communicated through signs, newspaper announcements or mailed notices and thus would not be preempted. See CAL. CODE REGS. tit. 22, § 12601(d)(1)(A)-(C) (2001).
exposed to carcinogenic or reproductively toxic pesticides will have additional incentives to avoid pest control techniques that lead to such exposures.

IV
ISSUES FOR THE FUTURE

In many ways pesticides represent a unique regulatory phenomena. Designed to be highly toxic, a pesticide is released into the physical environment with the specific purpose of killing other living organisms. Surprisingly, although pesticides can potentially contaminate several different environmental media, environmental regulatory statutes have historically taken a hands-off approach, leading to a significant disparity in levels of regulation between pesticide use and other potentially polluting industrial activities. Instead, the primary vehicle for regulating pesticides has been the licensing-based approach of FIFRA, which is implemented in California by DPR.

This article demonstrates the flaws in a license-based approach to regulating pesticide use. Licensing statutes such as FIFRA mire society in endless risk assessment, fail to allocate fairly the risks of uncertainty, and lack effective incentives for evaluation of non-toxic alternatives. In recent years there have been indications that the regulatory agencies may finally be agreeing with this assessment. In California, at least, small but definite steps are being taken to regulate pesticide use as simply another industrial activity, subject to the same environmental standards as any other potential source of pollution. While command and control of pesticide use may thus be just around the corner, there are still reasons to doubt the eventual success of the purely regulatory approach. Similar to a license-based approach, standard setting under the command and control approach is highly susceptible to arguments regarding cost and technical feasibility. This is especially true given that the

341. For a health-conscious society, the normal reaction to the release of such a chemical would be outrage, and a strong and relatively forceful regulatory scheme, such as those used to regulate toxics under the Clean Air and Clean Water Acts, or under hazardous waste statutes CERCLA and RCRA. For pesticide use, however, the regulatory response has been, at best, ambiguous.
342. This movement is best illustrated by the recent efforts of DPR and the State Water Resources Control Board to work together in regulating pesticide contamination of surface water. See supra note 203 and accompanying discussion.
343. A good example is provided by the federal and state Safe Drinking Water Acts. Because they incorporate cost and technical feasibility concerns, MCLs are
burden of establishing harmful pesticide discharge or exposure levels under command and control statutes still lies with the regulating community and not with pesticide users or manufacturers. In the charged political atmosphere that quickly surrounds any attempt to restrict pesticide use, it seems unlikely that tough, technology-forcing standards for pesticide pollution will be implemented any time in the near future. If and when such standards are set, it is further doubtful that citizens will be given any role in monitoring and enforcing statutory violations. Instead, successful implementation will depend on the degree to which the state agencies maintain sufficient budgets and policy direction in the face of intense lobbying pressure from industry.\footnote{344}

Lurking amidst this rather bleak forecast is Proposition 65, which fortuitously avoids the big picture "policy" debates that normally slow traditional regulation to a standstill. The Statute does not, for example, mandate funds for alternative pest control technology, nor does it require a reduction in use for the most toxic pesticides. Instead, the Statute sets forth the conditions - no discharge and no undisclosed exposures - under which pesticide use may continue, if it is to continue, into this new century. While the very existence of Proposition 65 is no doubt disconcerting to the chemical and agricultural industries, the basic premises of the Statute, that toxic pesticides should not be discharged into drinking water sources and that people should not be unknowingly exposed to pesticide chemicals, is reasonable. Indeed, citizens would likely be surprised to learn the extent to which pesticide use in California fails to meet these basic requirements.

typically less restrictive than the purely health-based maximum contaminant level goals (MCLGs) or public health goals established for policy guidance. \textit{Compare} 40 C.F.R. §§ 141.11 - 141.12 (2000) \textit{with} §§ 141.50 - 141.51. \textit{See} CAL. CODE REGS. tit. 22, § 64444 (2001); CAL. HEALTH & SAFETY CODE §§ 116.275(f), 116.365(c) (West 2000). Even with purely health-based standards, such as the water quality standards of the Clean Water Act or the reference exposure levels for toxic air contaminants in California, feasibility concerns have the potential to delay implementation for years. \textit{See supra} notes 197, 203-204 and accompanying discussion (noting that the Toxic Air Contaminant Program generally is not enforced with regard to pesticide contamination); \textit{supra} notes 310-312 and accompanying discussion (noting the tendency of TMDL implementation to be delayed by cost feasibility concerns.)

As this article has indicated, the application of Proposition 65 to pesticide use in California would create strong incentives on the part of manufacturers and users to reduce pesticide pollution. Pesticide users in particular would, for the first time, have real economic reasons to explore, and adopt where feasible, less toxic and less chemically intensive methods of eliminating pests. Despite these benefits, however, the question of whether Proposition 65 will force safer methods of pest control in the years to come is still unclear. Proposition 65 demands a wholesale adoption of the precautionary principle on a day-to-day basis. It requires businesses to internalize the costs of pesticide pollution into their own cost benefit balance. In sum, Proposition 65 may call our collective societal bluff as to whether we are serious about eliminating toxic pollution. In doing so, Proposition 65 creates controversy for the simple reason that the value we place on pesticide use, as with many economically important activities, is less than clear.

In part, the difficulty in adopting the precautionary principle as a basis of regulation is due to the same uncertainty that hinders the implementation of well meaning but ultimately ineffective environmental legislation. For Proposition 65, the issue can be framed through the lens of ecological economics and cost internalization. If we decide, for example, that pesticide users and manufacturers should internalize the external costs of their operations, is Proposition 65 the proper vehicle to make that happen? Clearly this issue is debatable. The Statute is certainly subject to the criticism that it goes too far. Several provisions, including the measurement of daily discharge under the discharge prohibition, for example, or the mandatory 1000-fold safety factor applied to reproductive toxicants, are susceptible to the charge that Proposition 65 sets the "costs" side of the equation too high, thus distorting the economic "cost-internalization" calculation. According to this line of reasoning, the high costs imposed by Proposition 65 prevent even relatively benign businesses from conducting operations in California, to the ultimate detriment of society.

The easy answer to this charge is to consider how Proposition 65 has actually fared in practice when applied to various industries. In the lead discharge cases, for example, far from driving away business, Proposition 65 single-handedly induced the plumbing industry to adopt lead-free products in

345. See, e.g., Jansen, supra note 16; Margulies & Graves, supra note 16; Coughlin & Murray, supra note 55.
less than 10 years. While other examples illustrate the power of Proposition 65 to force industries to adopt non-toxic alternatives, no example exists to date in which Proposition 65 has shut down a productive and beneficial industry in California.

The ability of Proposition 65 to move industry away from toxics does not answer the broader question, however, of whether such movement is in every case socially desirable. In considering this more fundamental issue, two analyses are suggested. First, it is clear that Proposition 65 is much more than simply a set of highly protective standards over which reasonable minds might disagree. Many aspects of the Statute, including its liability models, burden shifting and simplified citizen enforcement provisions, fill regulatory niches often left vacant by more traditional statutory approaches. As this article has illustrated, the advantages offered by Proposition 65's regulatory approach are particularly striking when applied to pesticide activities, which have thus far managed to evade most forms of direct regulation. Indeed, in the area of pesticide regulation it is hard to argue that Proposition 65's citizen-driven, direct liability approach would not be a significant improvement over current policies.

The question of whether Proposition 65's highly protective standards are ultimately necessary or even beneficial is, of course, a more difficult analysis, intertwined as it is with the uncertainties surrounding toxic risk assessment. Even from a pure risk assessment perspective, the Statute appears at times to stretch the boundaries of common sense. Why, for example, should risk be measured at the point a toxic discharge enters a far away source of drinking water—a stream in the Central Valley for example—if we know that no person will be directly consuming the water contained within? Why should we assume that an individual who is exposed to drift from a carcinogenic pesticide will be exposed to that chemical for 70 years instead of the occasional exposures that are more likely to occur over that person's lifetime? If these are not realistic scenarios then is not

346. See Rechtschaffen, supra note 73.
347. These include elimination of lead from ceramic tableware, calcium supplements and mini-blinds, removal of trichloroethylene (a known carcinogen) from typewriter correction fluids such as liquid paper, and the numerous successful air cases involving the negotiated reductions—as a means to avoid the warning requirement—of toxic chemicals including chloroform, methylene chloride, ethylene oxide, lead, and diesel exhaust from polluting facilities. See, e.g., Well Testimony, supra note 16, at 5-7; AG Prop. 65 List; Freund, supra note 17, at 343-47.
Proposition 65's statutory mandate simply the latest example of regulatory overkill?\textsuperscript{348}

To answer these questions, it is necessary to consider that the Proposition 65 regulations impose liability on a business only for discharges or exposures caused by its own activities and not for those of other business operations.\textsuperscript{349} Thus, if ten different users are applying pesticides in a manner that results in discharges into nearby streams, or exposes nearby residents to aerial drift, each will be liable only for the amount resulting from its own activity, despite an overall impact to the stream or person that may be 10 times the amount contributed by each individual business. Multiply these figures by the number of chemicals contained in the soup of contaminants that human activities create on a daily basis and the conservative assumptions of Proposition 65 begin to appear more sensible.\textsuperscript{350}

In sum, Proposition 65 takes a stab at assessing the incremental costs of many different polluting activities on a cumulative basis. To be sure, it is a rough approximation, but in many respects its conservative assumptions are more realistic than other regulatory schemes that purport to offer comprehensive risk assessment while limiting their risk analysis to individual chemicals.

Another way to consider Proposition 65's highly protective standards is in the familiar context of burden shifting. Essentially, Proposition 65 places two burdens on industries wishing to release toxic chemicals as part of their business operations. First, as discussed, the Statute shifts the burden to industry to establish that detectable discharges or exposures do not pose a significant risk according to the specific risk criteria set forth in the statute.

Similar to other protective statutory regimes, however, Proposition 65 also imposes a second, invisible burden on businesses that release listed chemicals. Under this burden, risk assessment is conducted within a statutory context that implicitly considers the many sources of toxic chemicals released in our modern industrial society. The business that discharges a listed chemical into a source of drinking water, or exposes persons to such chemical, must thus defend its action according

\textsuperscript{348} See, e.g., Rick Lovett, Science Mostly Ignored in Prop. 65 Enforcement, Corash Tells SOT, 10 PROP 65 NEWS, May 1996, at 12.

\textsuperscript{349} See CAL. CODE REGS. tit. 22, §§ 12721(a), 12821(a) (2001). This principle was repeated in the initiative's ballot arguments and clarified in the regulations.

\textsuperscript{350} See supra notes 106-107 regarding health impacts of low level contaminant combinations.
to risk criteria that acknowledge that there are many sources of toxic discharge in our physical environment. Seen from this perspective, a challenge to Proposition 65's preventative standards is ultimately a challenge to this second burden, the burden, one could say, of the industrial age. The innovation of, and the controversy surrounding, Proposition 65 derives from its choice to lay this second burden at the feet of industry, rather than the general public.

The issue of whether Proposition 65 ultimately makes for good policy is particularly relevant as applied to pesticide use in California. The strength of the pesticide and agricultural lobbies, combined with a vague and perhaps incorrect public perception that intensive pesticide use is essential to the supply of low-cost, quality food products, make any direct challenge to the status quo politically difficult.\textsuperscript{351} Thus far, the strength of the pesticide lobby has prevented direct regulation under both the Clean Air and Clean Water Acts. Instead, pesticide regulation has been sequestered within the narrow policy arena of FIFRA, in which products are evaluated through a world view that assumes intensive chemical approaches to pest control.

On this skewed playing field, Proposition 65 has thus far fared no better, and perhaps worse than other statutes in controlling pesticide pollution. At the time of this writing, no significant Proposition 65 action has been successfully brought against polluting pesticidal activities in California. Clearly, the significant bottleneck in implementing Proposition 65's protective provisions remains the listing of chemicals under the Statute. Once a chemical is listed, the State loses, to a degree, its traditional regulatory discretion as to how to implement statutory intent. Seen from this perspective, the State's reluctance to apply Proposition 65 vigorously to pesticide use in California is hardly surprising, since to do so would appear to concede jurisdiction over pesticide regulation to citizen enforcers, subject only to the authority of the Attorney General or local district attorneys to join in the case.\textsuperscript{352}

\textsuperscript{351}. See, e.g., George Soares, Proposition 65 and California Agriculture: Avoiding the Wreck 1-7 (May 20, 1999) (unpublished manuscript, on file with author) (arguing that Proposition 65 represents a real threat to production agriculture and related industries in California).

\textsuperscript{352}. In practice, the Attorney General's Office believes it has the authority to intervene in and settle cases it believes not to be in the public interest. See AG Brief, supra note 14, at 7 (informing the court that AG would take control of the case away from a private plaintiff where the Attorney General judged that the private plaintiff was not acting in the public interest.); Well Testimony, supra note 16, at 8 ("[I]n a number of cases, involving nail polish, lead wine bottle caps, and crystalline silica in
This article has attempted to demonstrate that the state's reluctance to implement Proposition 65 may in the long run be short sighted. Proposition 65 would not end the use of pesticides in California, but would focus immediate attention on those uses which contaminate drinking water sources or cause exposures to individuals. As to exposures, Proposition 65 requires only that a warning be provided by the parties responsible. Thus, if Proposition 65 were to cause certain pesticide uses or chemicals to be discontinued, it would be due to uncontrollable toxic discharges or due to exposures that a company for publicity reasons did not wish to disclose. These do not appear to be unreasonable operating conditions to place, at this late date, on any industrial activity.

Aside from the justifiable health protections offered by the Statute, there are practical reasons for applying Proposition 65 to pesticide use in California. For most public interest organizations working on pesticide issues, a central policy goal is to move pest control technologies away from the use of toxic chemicals. Typically, these organizations argue for government mandated reduction in the use of the most toxic pesticides and concurrently, mandatory implementation of non-chemical pest control technologies, usually some form of integrated pest management. The problem for these organizations, and for society, is that there is no current regulatory mechanism through which such a transition is likely to take place.

The unique aspects of pesticide use raise particular doubt that such a transition can occur, even if current regulatory approaches were to be fully implemented. As discussed, regulation of pesticides differs from traditional command and control strategies in that the focus of regulation is not an incidental "byproduct" of a manufacturing process, but rather the fate of the actual "product" after it has been released into the

building products, the Attorney General has effectively taken over particular matters to assure that they are handled appropriately."). To provide the Attorney General with the necessary notice regarding private enforcement, recent amendments to Proposition 65 require private parties to provide notice to the Attorney General of "events in their cases" and of the terms of any settlement. See CAL. HEALTH & SAFETY CODE § 25.249.8(e)-(f) (West 2000). At the time of this writing, the authority of the Attorney General to intervene and settle an ongoing private enforcement action is untested.

353. See ENVIRONMENTAL WORKING GROUP, WHAT YOU DON'T KNOW COULD HURT YOU: PESTICIDES IN CALIFORNIA'S AIR 5 (1999); KEGLEY, ORME & NEUMEISTER, supra note 150, at 3-5, 10-11; HEAVNER, supra note 169, at 8; CALIFORNIANS FOR PESTICIDE REFORM, supra note 197, at vi. These "policy recommendations" are routinely ignored by the regulatory community.
environment. In evaluating the potential of different policy approaches to force technology towards cleaner, non-toxic forms, the consequence of this difference could be striking. Consider that technology forcing in the area of pest control does not aim to “regulate” industry as much as to phase out an entire industrial sector that has thus far reaped incalculable financial benefit by maintaining the status quo of intensive pesticide use. Clearly this is a tall order for FIFRA, given its licensing structure based upon the continued use of chemical pest control. Nor is there any precedent in which command and control approaches such as the Clean Water or Clean Air Acts have achieved such a result. It is, in fact, highly unlikely that such traditional approaches will be successful in creating “cleaner” pollution control technologies for the simple reason that pesticide manufacturer and related lobbying groups will assuredly oppose with all their power the implementation of any “alternative technology” mandate that does not offer the same types of commercial possibilities as their patented chemical pesticide products.

While Proposition 65 may not offer an automatic solution to this problem, it certainly provides a more promising approach. Proposition 65 does not set policy, but instead establishes incentives that have the potential to change the behavior of pesticide manufacturers and users. Theoretically, many users have no vested interest in continuing to use pesticides, and small incentives might persuade them to limit their use. For these actors, pesticide contamination is an incidental byproduct of the process of controlling pests. By forcing users to internalize the costs of such contamination, Proposition 65 creates immediate incentives to consider other options.

354. The best analogy would be the Clean Air Act's gradual attempts to move automobiles away from gas-powered engines to electric, hydrogen or other clean technologies. The oil industry is similar to the pesticide industry in the sense that technology forcing regulation threatens its industrial base. Two distinctions between these examples are that: 1) oil is used in a number of different industries and for different uses, whereas pesticides do not have utilitarian use besides the control of pests; and 2) car manufacturers, unlike many industrial agricultural operations, may conceive more easily of a clean alternative to the current production method. Even with these distinctions, however, the technology forcing mandates of the Clean Air Act, despite thirty years in existence and despite the fact that feasible alternative technologies have been available for decades, have not yet been able to force a transition away from gas powered automobiles.

355. One exception to this is the emerging field of biotechnology, which may provide pesticide manufacturers with an apparently less toxic alternative that may still be patented and sold for profit to agricultural users.
CONCLUSION

Ultimately, Proposition 65 has the ability to bring pesticide use into the 21st century of industrial regulation. Indeed, at a time when virtually any other industrial activity is heavily regulated, with strict monitoring and disclosure requirements, pesticide use has managed to go its own way. Under the guise of trade secret laws, pesticide manufacturers can avoid disclosure of the actual contents of their pesticide products. Further, in California, no notice is required prior to pesticide applications, nor is such information even available upon request. Such secrecy is of course antithetical to a fundamental premise of Proposition 65, that citizens should be apprised of the toxic chemicals to which they are being exposed.

The application of Proposition 65 would substantially alter this status quo. While the ultimate impact of Proposition 65, were it to be fully applied to pesticide use in California, is difficult to predict, it seems likely that the most toxic pesticides with propensities towards contamination would be restricted or eliminated from use. Such restrictions would in turn trigger greater support on the part of pesticide users, state agencies and citizens for research and development into alternate forms of pest control. At that point, despite the incentive mechanisms laid in place, Proposition 65 guarantees no particular outcome. It is possible that the application of the Statute to pesticide use could in the long run accelerate a transition to genetically engineered food crops, with its host of policy and ethical challenges. In the alternative, the increased awareness of citizens regarding pesticide exposures as a result of the Statute could lead to an explosion of the growing organic farming industry.356 In the end, the only certainty is that Proposition 65 could eliminate pesticide discharges into drinking water sources and undisclosed exposures to citizens. This is a result that all Californians should be able to live with.