



LIABILITY FOR WATER CONTROL STRUCTURE FAILURE DUE TO FLOODING

Edward A. Thomas, Esq.
Michael Baker, Inc.
“Challenge Us”

Association of State Floodplain Managers

**Produced in Support of the Annual Meeting of
The Floodplain Management Association
September 7, 2006**

Preface

This paper is a pro bono effort of the author, sponsored by Michael Baker, Inc., the Association of State Floodplain Managers, and the Flood Control District of Maricopa County. The opinions contained in the paper are the author's and do not necessarily represent the views of any organization or company. Sam Riley Medlock, CFM, a student at Vermont Law School, provided legal research, updated material, and assistance with image credits for this 2006 edition with financial support from the Association of State Floodplain Managers.

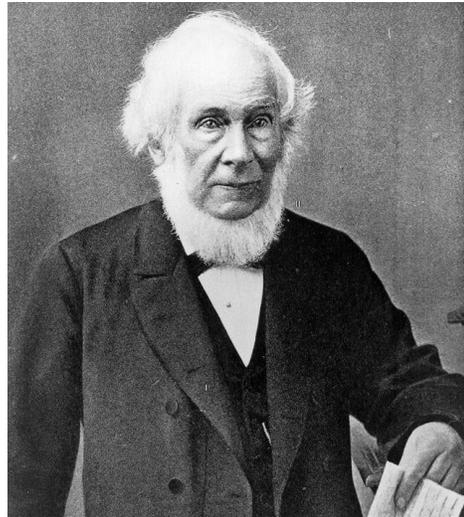
This paper is based on general principles of law. It is not legal advice. For legal advice please consult an attorney licensed to practice in your jurisdiction. This paper is designed to provide both a laypersons overview of the law concerning the liability for the failure of major Water Control Facilities such as Dams and Levees; and to provide guidance which will assist Attorneys in conducting legal research in this area of the law.

I. Summary

This paper will examine the standards used by courts in the United States to assess liability for damage due to the failure of a flood control structure. As used in this paper, "flood control structure" includes dams, levees, and other major non-natural structures that store, divert, or transport large volumes of water. Determining who will pay for such damage involves a fundamental conflict between two of the most important beneficial incidents of land ownership: the right of exclusive occupation and the right of utilization. The owner of the land on which the flood control structure is situated desires to utilize fully his or her land, and often to help provide beneficial services such as flood control and water supply to the community. The damaged property owner wishes to exclusively occupy and enjoy her land without serious injury from adjacent property owners. Either right carried to an extreme requires one owner to surrender valuable property rights to the other. The legislature or the courts must draw a line between each party's property rights in such a way as to fairly reconcile their

conflicting desires. Exact placement of that boundary line between the property rights of owners will be a reflection of existing social, political, and economic conditions that prevail in society.

Early English Common Law established a boundary line that greatly favored protecting the adjacent property owner from damage by someone who had caused an artificial change in the flow of water. Later, some jurisdictions in the United States modified this doctrine to hold that a water control facility owner would only be liable for damage resulting if the facility failed if the plaintiff could demonstrate that there was a lack of due care in building or maintaining the water control structure.



John Rylands (1801-1888), owner of the Ainsworth Mills, Lancashire, UK, whose impoundment flooded his neighbor's mine, giving rise to the concepts of dangerous accumulations, escape of same, and liability without fault. Image credit: John Rylands University Library, Manchester, UK.

Today, virtually all states impose some form of strict liability on owners of water control structures that cause harm to others even if the owner utilized utmost care.

II. English Common Law

Early English Common Law held that a person was absolutely responsible for any damage resulting from his actions regardless of intent or fault.¹ Absolute liability supported two important goals of the law: It discouraged dangerous conduct² and placed the burden of paying damages on the party who caused the problem.³

The Industrial Revolution placed a premium on the encouragement of commercial and industrial activity. The concept of strict liability was considered an impediment to

¹ See, e.g., *Anonymous*, Y.B. Edw. IV F. 7 pl. 3 (K.B. 1466) where Justice Brian stated "... if a man commits an assault on me and I cannot avoid him... and I lift my stick in self-defense... and there is a man in back of me and I injure him in lifting my stick in that case he would have an action against me, although my lifting the stick was lawful to defend myself and I injured him with-out intent."

² James, *Accident Liability Reconsidered: The Impact of Liability Insurance*, 57 Yale L.J. 549 (1948) [hereinafter cited as James].

³ See, e.g., *Lambert v. Bessey*, 83 Eng. Rep. 220 (K.B. 1681).

commercial and industrial activity. As the Industrial Revolution swept through England, the courts gradually developed the concept that if there was no fault⁴ on the part of the party who caused the harm then there should be no payment of damages to the injured party. In this manner a transition was made to a standard of negligence for most conduct between two parties where one suffered damage as a result of the other's actions.⁵

At the same time that the concept of negligence was developing, the landmark case of *Rylands v. Fletcher* was decided.⁶ One commentator has observed that perhaps no case in history has occasioned more controversy and comment.⁷ Briefly stated, the facts of the case are that a mill owner constructed a dam to obtain water power. The site of the water reservoir created by the dam was riddled with abandoned and blocked-up mine shafts. These shafts connected to active mine workings on an adjacent property. Ten days after the reservoir was filled, water broke through the abandoned shafts and caused serious flood damage to the mine on the adjacent property. If the water had poured directly into the adjacent mine shaft rather than coming to rest for ten days, the English courts would have found that a trespass had taken place. Had the water slowly seeped into the mines, the English courts would have found this to be an abiding nuisance. The mill owner would have been liable for the damage caused in either case.⁸

There is a clear indication in *Rylands* that the contractor who built the dam was aware of the abandoned mine shafts in the area where the reservoir would be and was negligent in going forward with the construction nevertheless. However, Common Law did not yet recognize the principal that an employer might be held liable for the

⁴ For the purposes of this article the term fault means legal fault. Moral fault is not significant to this article. See, W. Prosser, *The Law of Torts 18* (1971) for a discussion of the subtle difference between moral and legal fault.

⁵ See, Sheldon, *Return to Anonymous: The Dying Concept of Fault*, 25 Emory L.J. 163, (1976) [hereinafter cited as Sheldon].

⁶ 159 Eng. Rep. 737 (Ex. 1865), *rev'd*, L.R. 1 Ex. 265 (1866), *aff'd*, L.R. 3 H.L. 330 (1868).

⁷ See, H. Foster and W. Kecton, *Liability Without Fault in Oklahoma*, 3 Okla. L.R. 1 (1950) [hereinafter cited as Foster].

⁸ F. Bohlen, *The Rule in Rylands v. Fletcher*, 59 U. Pa.L.Rev. 298, 311, 312 (1911).

negligence of an independent contractor.⁹ At trial, therefore, courts found that no existing theory of law permitted recovery by the mine owner. On appeal, the decision by the trial court was overruled, and Justice Blackburn stated a theory justifying recovery by the mine owner based on the ancient Roman maxim *sic utere tuo ut alienum non laedas* – use your property so that you do not damage property of another.¹⁰ Blackburn wrote that:

...the true Rule of Law is, that the person who for his own purposes brings on his lands and collects and keeps there anything likely to do mischief if it escapes, must keep it in at his peril, and, if he does not do so is *prima facie* answerable for all the damage which is the natural consequence of its escape.¹¹



Colin Blackburn, (1813-1896).
Image credit: University of
Pennsylvania Law School.

A strict liability rule of law was not strange to the Common Law of England. It was well established in cases of trespass, nuisance, and straying animals.¹² Blackburn’s generalization of a widely accepted theory of law was sharply limited on further appeal to the House of Lords.¹³ There Lord Cairns stated that the rule of law articulated by Blackburn applied only to the “non-natural” use of land, as distinguished from “any purpose for which it might in the ordinary course of the enjoyment of the land be used.”¹⁴ Later English cases elucidated the meaning of

⁹ W. Prosser, *Selected Topics on the Law of Torts*, p. 136 (1953) [hereinafter cited as Prosser].

¹⁰ Foster, *supra*, at 31.

¹¹ *Rylands v. Fletcher*, L.R. 1 Ex. 265, 279-80 (1866).

¹² Foster, *supra*, p. 31.

¹³ Prosser, *supra*, p. 139

¹⁴ *Rylands v. Fletcher*, L.R. 3 H.L. 330, 338 (1868). The Arizona Supreme Court, in denying “strict liability with respect to publicly owned water control facilities, indicated that “...The Arizona Canal meets all the requirements to be considered at this time a natural watercourse flowing through the Salt River Valley. By this we mean that it has developed the characteristics of a natural watercourse, but this does not mean that the water belongs to the public as do all wholly natural waters (A.R.S. § [45-101](#)), nor do we imply that the Water Users are relieved from the duty to maintain and repair the canal (A.R.S. §§ [45-204](#) and [45-205](#)).” *Ramada Inns, Inc. v. Salt River Val. Wat. Users' Ass'n*, 111 Ariz. 65 (1974).

“non-natural” to mean unusual, abnormal, or inappropriate in the circumstances of the surrounding area.¹⁵

III. Common Law in the United States

When *Rylands v. Fletcher* was decided, courts in the United States had just begun to develop the concept of negligence in actions for damages between two otherwise blameless individuals.¹⁶ The *Rylands* rule of law was accepted in the Massachusetts courts,¹⁷ which had first articulated the concept of negligence eighteen years earlier.¹⁸ Shortly after the Massachusetts courts accepted the rule of *Rylands*, that rule was strongly repudiated by influential decisions in New York, New Hampshire, and New Jersey.¹⁹ The decisions of these courts focused on the broad statement of the law



John W. Mason (1846-1927), Fergus Falls City Attorney who successfully argued against application of strict liability before the Supreme Court of Minnesota in *City Water Power Co. v. Fergus Falls*. Image credit: Otter Tail County Historical Society.

articulated by Justice Blackburn, rather than the more limited legal principle articulated by the appeals court.

These courts felt that *Rylands* indicated that the defendant would be absolutely liable in all cases whenever anything in his control escaped and caused damage. Thus, the *Rylands* rule of law was misstated and rejected by these and other jurisdictions as misstated. *Rylands* acquired a bad reputation in some states as “a Foreign aberration beyond all reason.”²⁰ Today, however, the rule of *Rylands v. Fletcher* is accepted by name or inference in far more jurisdictions than reject it. It is accepted in Arkansas,²¹ California (except for publicly owned

¹⁵ Prosser, *supra* p. 141, 142.

¹⁶ Sheldon, *supra*, p. 167.

¹⁷ Prosser, *supra*, p. 149, citing *Ball v. Nye*, 99 Mass. 582, 97 Am. Dec. 56 (1868).

¹⁸ Sheldon, *supra*, p. 167 citing *Brown v. Kendall*, 60 Mass. (6 Cush.) 292 (1850).

¹⁹ Prosser, *supra*, p. 145 citing *Losee v. Buchanan*, 51 N.Y. 476, 10 Am. Rep. 623; (1873); *Brown v. Collins*, 53 N.H. 442, 16 Am. Rep. 372 (1873) and *Marshall v. Wellwood*, 38 N.J.L. 339, 20 Am. Rep. 394 (1876).

²⁰ Prosser, *Id.* At 150, 151.

²¹ *Chapman Chemical Co. v. Taylor*, 215 Ark. 630, 222 S.W. 2d 820 (1949); *North Little Rock Transportation Co. v. Finkbeiner*, 243 Ark. 596, 420 S.W. 2d 874 (1967). But, c.f., *Dye v. Burdick* 262

flood control works, modified recently to be more like strict liability),²² Colorado,²³ the District of Columbia,²⁴ Florida,²⁵ Indiana,²⁶ Iowa,²⁷ Kansas,²⁸ Maryland,²⁹ Massachusetts,³⁰ Minnesota,³¹ Missouri,³² New Jersey,³³ New Mexico,³⁴ Ohio,³⁵ Oregon,³⁶ Rhode Island,³⁷ South Carolina,³⁸ and West Virginia.³⁹

In addition, several states use different rules of law such as absolute nuisance, trespass, or nuisance *per se* in such a way that it is really the implementation of the rule in the *Rylands* case.⁴⁰ The Supreme Court of Texas, which had strongly rejected the *Rylands* rule in *Turner v. Big Lake Oil Co.*,⁴¹ now has accepted the doctrine of strict liability for cases of intentional discharge of a harmful substance, but not for the extraction of groundwater.⁴² Thus, despite strong and even vituperative denunciation

Ark. 124, 553 S.W. 2d 833 (1977) which indicates that a dam across a natural watercourse was not an ultrahazardous thing, and, therefore, the *Rylands* rule was inapplicable.

²² *Green v. General Petroleum Corp.*, 205 Cal. 328, 270 p. 952 (1928). The principle, however, was not applied to a reservoir in *Sutliff v. Sweetwater Co.*, 182 Cal. 34, 186 P. 766 (1920); nor was it applied to government-owned flood control works including levees. See, *Belair v. Riverside County Flood Control District*, 47 Cal. 3d 550, 764 P.2d 1070 (1988). However the recent decision in the Paterno case seems suspiciously like Strict Liability to this author and to other commentators as we shall see later in this paper. See, *Paterno v. State*, 123 Cal. App. 4th 548; 20 Cal. Rptr. 3d 282, (Cal.App.4th) (2004).

²³ *Sylvester v. Jerome*, 19 Colo. 128, 34 P. 760 (1893), *Barr v. Game Fish & Parks Comm'n*, 497 P.2d 340 (Colo. Ct. App. 1972), *Gladin v. Von Engeln*, 195 Colo. 88, 575 P.2d 418, 1978 Colo. LEXIS 687 (1978).

²⁴ *Brennan Construction Co. v. Cumberland*, 29 App. D.C. 554, 15 L.R.A. (N.S.) 535 10 Ann. Cos. 865 (1907).

²⁵ *Cities Service Co. v. State*, 312 So.2d 799 (Fla. 2d Dist. Ct. App. 1975).

²⁶ *Niagra Oil Co. v. Jackson*, 48 Ind. App. 238, 91 N.E. 825 (1910).

²⁷ *Healey v. Citizens Gas & Electric Co.*, 199 Iowa 82, 201 N.W. 118 (1924).

²⁸ *State Highway Commission v. Empire Oil & Refining Co.*, 141 Kan. 161, 40 P.2d 355 (1935).

²⁹ *Toy v. Atlantic, Gulf & Pac. Co.*, 176 Md. 197 4 A.2d 757 (1939).

³⁰ *Clark-Aiken Co. v. Cromwell-Wright Co.*, 367 Mass. 70, 323 N.E.2d 876 (1975).

³¹ *Bridgeman-Russell Co. v. City of Duluth*, 158 Minn. 509, 197 N.W. 971 (1924).

³² *French v. Center Creek Powder Mfg. Co.*, 173 Mo. App. 220, 158 S.W. 723 (1913).

³³ *State, Dep't of Environmental Protection v. Ventron Corp.*, 94 N.J. 473, 468 A.2d 150, 1983 N.J. LEXIS 2744, 19 Env't Rep. Cas. (BNA) 1505, 13 Env'tl. L. Rep. 20837 (1983).

³⁴ *Gutierrez v. Rio Rancho Estates, Inc.*, 93 N.M. 755, 605 P.2d 1154, 1980 N.M. LEXIS 2629 (N.M. 1980).

³⁵ *Defiance Water Co. v. Olinger*, 54 Ohio St. 532, 44 N.E. 238 (1896)

³⁶ *Brown v. Gessler*, 191 Or. 503, 230 P. 2d 541 (1951).

³⁷ *Gagnon v. Landry*, 103 R.I. 45, 234 A. 2d 674 (1967).

³⁸ *Frost v. Berkeley Phosphate Co.*, 42 S.C. 402, 2 S.E. 280 (1894).

³⁹ *Weaver Mercantile Co. v. Thurmond*, 68 W. Va. 530, 70 S.E. 126 (1911).

⁴⁰ W. Ginsberg and L. Weiss, *Common Law Liability for Toxic Torts: A Phantom Remedy*, 9 Hof. L.R. 859, 913 (1981); [hereinafter cited as Ginsberg] Citing: *Dutton v. Rocky Mountain Phosphates*, 151 Mont. 54, 438 P. 2d 676 (1968); *Dixon v. New York Trap Rock Corp.* 293 N.Y. 508 58 N.E. 2d. 517 (1944); 293 N.Y. 508 58 N.E. 2d. 517 (1944); *Pennsylvania R. Co. v. Sagamore Coal Co.* 281 Pa. 233, 126 A. 386 (1924).

⁴¹ 128 Tex. 155, 96 S.W. 2d. 221 (1936).

⁴² *Atlas Chem. Indus., Inc. v. Anderson*, 524 S.W.2d 681, 1975 Tex. LEXIS 224, 18 Tex. Sup. Ct. J. 359, 51 Oil & Gas Rep. 74 (Tex. 1975), and *Friendship Dev v. Smith-Southwest Industries*, 576 S.W.2d 21, 576 S.W.2d 21 (Tex. 1978).

by some courts⁴³ and writers⁴⁴ the principles of *Rylands v. Fletcher* are now generally accepted by courts in the United States.⁴⁵ In applying the *Rylands* principle of strict liability, most courts will use the “ultrahazardous test” contained in the *First Restatement of Torts*, which provides that “...one who carries on an ultrahazardous activity is liable to another person whose land, person, or chattels the actor should recognize as likely to be harmed... although the utmost care is exercised to prevent the harm.”⁴⁶ The *Restatement* goes on to state that an activity is “ultrahazardous” if it (a) necessarily involves a risk of serious harm to the person, land or chattels of others which cannot be eliminated by the exercise of the utmost care, and (b) is not a matter of common usage.”⁴⁷ The *Restatement* specifically notes that it expresses no opinion as to whether a large water tank or reservoir is to be considered an ultrahazardous activity.⁴⁸ Other courts in determining whether to apply a *Rylands*-type test of strict liability will use the test set forth in the *Restatement (Second) of Torts* which focuses on the relationship of the object that caused the damage to the surrounding area.⁴⁹ Some



William Lloyd Prosser (1898-1972), Professor of Law, Boalt Hall, University of California, Berkeley. Image credit: G. Paul Bishop

⁴³ See e.g., *Turner v. Big Lake Oil*, *supra*.

⁴⁴ Smith, *Tort and Absolute Liability*, 30 Harv. L.Rev. 241, 319, 408 (1917); *Thayer Liability Without Fault*, 29 Harv. L.Rev. 801 (1916).

⁴⁵ Ginsberg, *supra*, p. 913 A notable exception is Arizona which has held in *Ramada Inns, Inc. v. Salt River Valley Water Users' Association*, 111 Ariz. 65, 523 P.2d 496 (1974) that the vital importance of the Arizona Canal precluded the imposition of a standard of strict liability.

⁴⁶ *Restatement of Torts*, §519 (1938).

⁴⁷ *Id.* at §520.

⁴⁸ *Id.* §520 Comment c. Caveat.

⁴⁹ *Restatement (Second) of Torts* § 519 (1976) provides:

- (1) One who carries on an abnormally dangerous activity is subject to liability for harm to the person, land or chattels of another resulting from the activity, although he has exercised the utmost care to prevent the harm.
- (2) This strict liability is limited to the kind of harm, the possibility of which makes the activity abnormally dangerous.

jurisdictions that purport to have adopted the test set forth in the first *Restatement* very clearly also look at the character of the area surrounding the object that caused damage.⁵⁰ A focus on both the object that caused the harm and the area that surrounded the object is fully in keeping with the rule of *Rylands v. Fletcher*.⁵¹

IV. Negligence

Professor Prosser has stated that:

“(i)t is quite apparent that the same courts which purport to reject the English principle (of *Rylands v. Fletcher*) have in fact applied it under another name, and that under that name the doctrine is universally accepted in the United States.”⁵²

However, Prosser also points out that because courts will look to the area surrounding an object that has caused harm to determine if strict liability should be imposed, there can be no universal statement that the release of water from a failed dam will always trigger strict liability on the part of the defendant.⁵³ Therefore, in any given situation a plaintiff might have to demonstrate that the release of water from a failed dam was caused by the negligence of the dam owner. Negligence is simply the creation of an unreasonable risk to others. Elements of a claim of negligence are duty, breach of duty, causation, and damage. Negligence may also be found *per se* if a defendant violates a statute requiring certain standards.⁵⁴

The following factors will be considered when determining whether an activity is abnormally dangerous:

- (a) existence of a high degree of risk of some harm to the person, land or chattels of others;
- (b) likelihood that the harm that results from it will be great;
- (c) inability to eliminate the risk by the exercise of reasonable care;
- (d) extent to which the activity is not a matter of common usage;
- (e) inappropriateness of the activity to the place where it is carried on; and
- (f) extent to which its value to the community is outweighed by its dangerous attributes.

⁵⁰ California has specifically adopted the *First Restatement*'s “ultrahazardous” test. In *Alonso v. Hills*, 95 Cal. App. 2d 778, 214 p. 2d 50 (1950), strict liability was imposed for blasting in a populated area. However, in *Houghton v. Loma Prieta Lumber Co.* 152 Cal. 500, 93 P. 82 (1907), strict liability was not imposed for blasting in a comparatively deserted area. Thus, California is really using the type of analysis set forth in the *Restatement (Second)*.

⁵¹ Prosser, *supra* at 149.

⁵² Prosser, *supra* at 170.

⁵³ Prosser, *Nuisance Without Fault*, 20 Tex. L.Rev. 399, 409 (1942).

⁵⁴ *Corpus Juris Secundum*, Vol. 65, negligence §1, §19 (1966).

A. Duty of Care

In determining if and how much care a dam owner had a duty to provide, the usual standard is how much care an ordinarily prudent person *in a similar circumstance* would take. The late Dean Thayer of Harvard University indicated that the duty of care in circumstances where life and limb were at stake is the highest possible.⁵⁵

Thayer indicated that:

An ordinary prudent person engaged in an enterprise which involved substantial risk would not only take every precaution to inform himself of the dangers of his enterprise before undertaking it, and to guard against such dangers in construction, but also to use unremitting diligence in maintenance and inspection.”⁵⁶

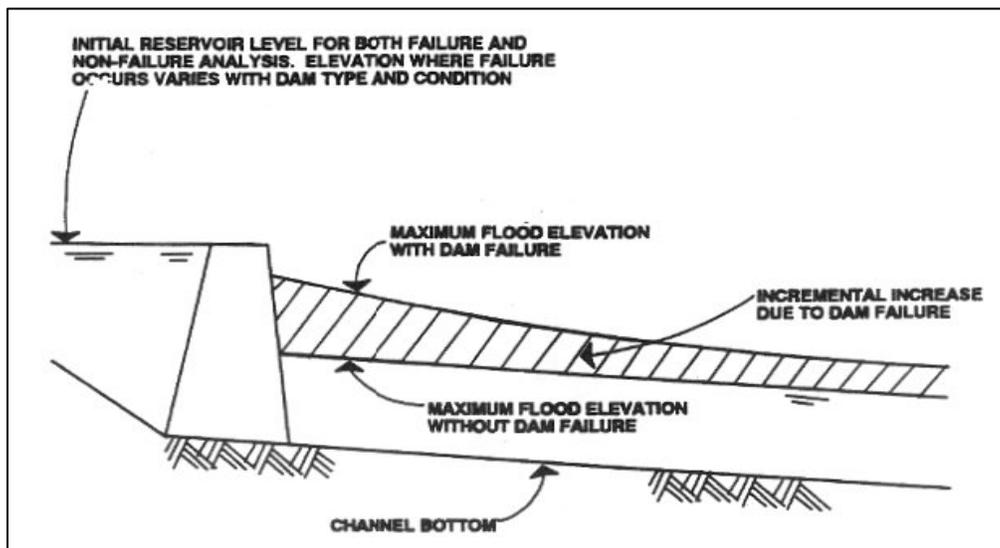


Illustration of incremental increase due to dam failure. Image credit: *Federal Guidelines for Selecting and Accommodating Inflow Design Floods for Dams*, prepared by the Interagency Committee on Dam Safety, 1994.

Advances in the sciences of hydraulics and hydrology enable a dam owner to determine what probable maximum floods could occur in an area⁵⁷ and what would be the likely result of the failure of the dam.⁵⁸ These recent advances in science should result in a gradual refinement of the nature and extent of the duty of care a dam owner

⁵⁵ Thayer, *Liability without Fault*, 24 Harv. L.Rev. 801, 805 (1916) [hereinafter cited as Thayer].

⁵⁶ *Id.*, at 806.

⁵⁷ U.S. Department of Interior, *Design of Small Dams*, pp. 37-97 (1977); U.S. Federal Emergency Management Agency, *Federal Guidelines for Selecting and Accommodating Inflow Design Floods for Dams*, pp. 1-37 (undated, published 1994) [hereinafter cited as FEMA]

⁵⁸ National Academy, *Safety of Existing Dams*, pp. 4-39 (1983).

owes to his or her downstream neighbors. At least one court has used these recent advances in determining the standard of care owed by a dam owner.⁵⁹



Teton Dam Failure, Teton River, ID, June 5, 1976. Image credit: U.S. Bureau of Reclamation (USBR), photo by Eunice Olson.

B. Breach of Duty

Proving that a dam owner has breached the duty of care can be difficult and is often complicated by the fact that often the portion of the water control structure that caused the harm has disappeared during the event, thus eradicating much of the physical evidence of the maintenance and even design of portions of the structure.⁶⁰ However, as a result of the loss of life and property due to the collapse of dams, the United States embarked on a national program of inspection of dams.⁶¹ Detailed reports on the design, condition, and degree of hazard of 8,818 dams throughout the

⁵⁹ *Barr, supra* at 343-344.

⁶⁰ Interviews with various employees of Michael Baker Inc.

⁶¹ Department of the Army, Office of the Chief of Engineers, *National Program of Inspection of Non-Federal Dams*, p. IV, (1982).

country are now available.⁶² Nearly 3,000 of the dams inspected were evaluated as unsafe, primarily due to inadequate spillway design. If a dam collapses, these reports will be invaluable both to plaintiff and defendant in arguing how carefully the dam owner exercised his special obligation to prevent loss of life and property downstream. At the present time a similar program for the inspection of levees and other major water control structures does not exist in the United States. In view of the spectacular and costly failure of the New Orleans levees after Hurricane Katrina, such a program could possibly be developed.

In situations like collapse of a water control structure, many courts would also permit the plaintiff to invoke the doctrine of *res ipsa loquitur*, that is, the thing (in this case the failure of a water control facility) speaks for itself. Presumably, the failed structure shouts “negligence!”⁶³ One commentator has observed that the use of *res ipsa loquitur* is essentially the equivalent of strict liability.⁶⁴ Certainly, shifting the



Landsat inundation imagery, New Orleans, Louisiana, August 31, 2005. Image credit: NOAA Coastal Services Center.

⁶² *Id.* p. VI.

⁶³ Gregory, *Trespass to Negligence to Absolute Liability*, 37 Va. L. Rev. 359, 381 (1951).

⁶⁴ Leflar, *Negligence in Name Only*, 27 N.Y.U. L. Rev. 564, 582 (1952)

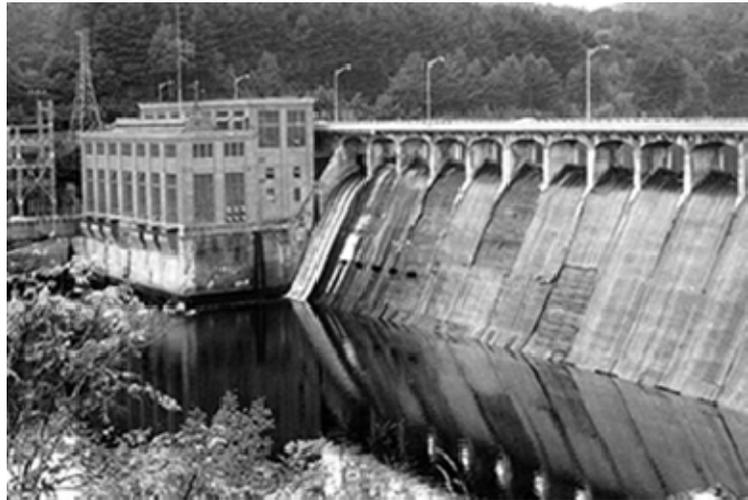
burden of coming forward with evidence so as to require the defendant water control structure owner to explain how his dam failed despite due care makes the plaintiff's case easier to present and improves the plaintiff's chances of being able to be permitted to present the case to a jury. Since juries find for the plaintiff in two-thirds to three quarters of all cases presented to them,⁶⁵ the effect of *res ipsa loquitur* may well be essentially the same as strict liability.⁶⁶

C. Causation

In order to recover under a negligence theory the plaintiff must also show that the failure of the dam caused damage to the plaintiff's property.⁶⁷

1. Causation of Damage –

Direct causation of harm in a case involving the release of water from a failed dam is usually fairly obvious. However, there are two circumstances in which causation could play an important role. The first involves dam failure during an extremely large flood in which it can be



Plaintiffs unsuccessfully argued in *Beauton v. Connecticut Light & Power* that the operator of Stephenson Dam, New Haven County, CT, was liable when their cottages were swept away by a flood in March 1936. Image credit: Housatonic Valley Association.

shown that the plaintiff's property would have been flooded whether the dam had failed or not. In this case the release of waters impounded by the dam may have been the immediate and first cause of the damage, flooding from some other source

⁶⁵ James, *Accident Liability: Some Wartime Developments*, 55 Yale L.J. 365, note 161 at 374 (1946).

⁶⁶ See, e.g., *Dye v. Burdick*, 262 Ark. 124, 553 S.W.2d 833 (1977), where the court refused to apply a strict liability test considering the facts of the case but permitted plaintiff to plead *res ipsa loquitur*; *Bowling v. City of Oxford* 267 N.C. 552, 148 S.E.2d 624 (1966); and *Brizendine v Nampa Meridian Irr. Dist.*, 97 Idaho 580, 548 P.2d 80 (1976).

⁶⁷ Prosser, *Handbook of the Law of Torts*, §30 (1971).

would have caused equivalent damage to the plaintiff's property and the plaintiff will not recover damages.⁶⁸

The second situation in which causation would be of significance is when several dams collapse like a series of dominoes. Proving that any one owner caused damage and/or apportioning damage among the owners is extraordinarily complex and involves endless permutation of fact and legal theory.⁶⁹ Nevertheless, advances in hydrology and hydraulic engineering make it possible to reconstruct the contribution each law made to downstream damage.⁷⁰ A convincing demonstration that the actions of the defendant did not, in fact, cause harm to the plaintiff may also be used as a defense.⁷¹

2. Damage

The requirements for proof of damage need little comment in this paper since the entire thrust of the article assumes damage to property. Nevertheless, note that failure of large water control facilities sometimes results in permanent damage to land and property



Property damage from the 1972 Black Hills-Rapid City flood totaled more than \$160 million. Image credit: Perry Rahn, South Dakota School of Mines and Technology.

⁶⁸ See, e.g., *Beauton v. Connecticut Light & Power Co.*, 125 Conn. 76, 3 A.2d 315 (1938).

⁶⁹ A. Becht and F. Miller, *The Test of Factual Causation in Negligence and Strict Liability Cases*, p. 125 *et. seq.* (1961).

⁷⁰ Personal knowledge of the author.

⁷¹ See, e.g. *St. Martin v. Gen. Homes-Louisiana*, 467 So.2d. 1361 (La. App. 5 Cir.) (1985).

values. The measure of any damages claimed will be the difference between the value of the property before the flood and the value of the property immediately after the flood.⁷²



February 1986 Yuba River levee failure inundated the towns of Linda and Olivehurst, causing more than \$400 million in damages. Image credit: David Rogers, University of Missouri-Rolla.

V. Defenses

Throughout this paper, the *Rylands* rule has been referred to as being one of “strict” rather than “absolute” liability. Absolute liability would imply that the defendant was an insurer.⁷³ Strict liability indicates that there are defenses to the allegation of liability and that a water control facility owner is not necessarily an insurer against all damage caused by a dam failure.⁷⁴

⁷² See, e.g., *State of Colorado v. Nicholl*, 150 Colo. 84, 370 P.2d 888 (1962).

⁷³ See, *Wheatland Irrigation District v. McGuire* 562 P.2d 287, 1977 Wyo. LEXIS 242 (Wyo. 1977).

⁷⁴ Thayer, *supra*, pp. 803-804

There are three generally recognized defenses against the imposition of strict liability: if the escape of the dangerous substance from the defendant's premises is due to a) the plaintiff's own fault, b) a *vis major*, the act of God, or c) to acts of third parties which the defendant had no reason to anticipate.⁷⁵ Except as noted, these defenses should be good against accusations of negligence including negligence *per se*, and the invocation of the principal of *res ipsa loquitur*.⁷⁶

A. Act of God

An Act of God or *vis major* is defined as: an unusual, extraordinary, sudden, and unexpected manifestation of the forces of nature, such as earthquakes, violent storms, lightning, and extraordinary or unprecedented floods, which could not have been reasonably anticipated, guarded against, or resisted.⁷⁷ Dams can be designed to have spillways that pass a volume of flood water so as to minimize or eliminate the possibility of failure of the dam itself because of flood.⁷⁸



Preliminary investigation of the failure of Tom Sauk Dam near Lesterville, Missouri, on December 14, 2005 indicate that water spilled over the sides of the impoundment possibly causing erosion of the outer embankment. Source: USGS Mid-Continent Geographic Science Center.

⁷⁵ 62 Am. Jur. 2d, Premises Liability §8 “*Escaping Substances; Doctrine of Rylands v. Fletcher.*”

⁷⁶ Thayer, *supra*, pp. 803-804

⁷⁷ American Jurisprudence, *1 Proof of Facts*, “Act of God” p. 143.

⁷⁸ U.S. Department of Interior, *Design of Small Dams*, pp. 37-95 (1977).

In determining whether a storm that caused a structure failure could have been anticipated, courts will look either to the maximum experienced rainfall in an area⁷⁹ or to an engineer's calculation of a foreseeable peril.⁸⁰ In a Colorado case, the court used the "probable maximum flood"⁸¹ as a standard to determine whether the spillway of a failed dam was properly designed.⁸²

The use of a standard to define Act of God as a storm resulting from the "most severe combination of critical meteorologic and hydrologic conditions" that are reasonably foreseeable to trained hydrologists may not be appropriate in all times and everywhere. The federal government recommends criteria that, like the *Rylands* rule, vary depending on the area in which a water control facility is to be located:

Situation in case of failure	Minimum Inflow Design Flood (IDF)
a. Loss of human life, extensive property damage, or serious social impacts attributable to dam failure occurs.	IDF is equivalent to the probable maximum flood (PMF).
b. Special case of a. Total reservoir volume is small compared to the PMF volume so that the threat to human life from floods is not increased by dam failure above that resulting from maximum controlled releases.	IDF selection is based on the level beyond which the potential for loss of human life from dam failure outflow does not exceed potential loss of life from controlled releases through spillways and other release facilities. A larger IDF should be selected if an economic analysis indicates this would be cost effective.
c. Loss of human life attributable to dam failure is not expected, and economic and social impacts are within acceptable limits.	IDF selection is based on an economic evaluation and other relevant factors.
d. Situation the same as in condition a.; however, an IDF equivalent to the PMF cannot be accommodated. No good alternatives are available due to constraints (physical, economic, social, etc.).	IDF is determined as described in section H.4. [this discusses the details of weighing the costs vs. benefits of alternatives to full compliance with the probable maximum flood design]. ⁸³

⁷⁹ See, e.g., *Bradford v. Stanley*, 355 So. 2d 328, 1978 Ala. LEXIS 2053 (Ala. 1978).

⁸⁰ See, e.g., *Diamond Springs Lime Co. v. American Rivers Constructors*, 16 Cal. App. 3d 581, 94 Cal. Rptr. 200 (1971).

⁸¹ The predicted probable maximum flood is always greater than recorded prior occurrence because the method is a maximizing process of recorded prior occurrence.

⁸² *Barr, supra*.

⁸³ See FEMA, *supra*, at p. 32. Designing a water control facility to take into account the magnitude of the harm that would occur due to failure seems generally accepted in existing case law. See, e.g., *Wolf v. St. Louis Independent Water Co.* 10 Cal. 541 (1858), *Dover v. Georgia Power Co.*, 168 S.E. 117 (1933), *City Water Power Co. v. Fergus Falls*, 128 N.W. 817 (1910).



NOAA aerial survey of New Orleans on August 31, 2005, two days after Hurricane Katrina made landfall. Image credit: NOAA Navigational Response Teams.

Although there is no direct reference in the standard definition of Act of God to considerations involving the consequences of dam failure, it is reasonable to assume that a prudent expert will follow good engineering practices as well as any state, local, and federal guidelines, to determine how to design and maintain a particular water control structure, including a review of the consequences of the failure of that structure.

It should be emphasized that, to be a valid defense, the Act of God must be the sole cause of a flood. If the defendant was also negligent because of poor maintenance procedures, the Act of God defense will not hold up.⁸⁴

B. Acts of Third Parties

A dam owner will not be liable for the unforeseeable acts of third parties. All commentators agree that if damage is caused by the act of a third party over which the defendant had no control, no liability will attach.⁸⁵



Flooding at the west end of the Ninth Ward, New Orleans, and outflow through levee breach as initial storm surge subsides. Image credit: NOAA.

C. Plaintiff's Fault

The modern sciences of hydrology and hydraulics permit us to chart the depth, velocity, and path of a flood caused by the failure of a dam. As previously noted, this fact has implications for the definition of the dam owner's duty of care, and may even influence the definition of what a prudent person would do with respect to a probable maximum flood. However, just as a person who stood next to a blasting operation might not be able to recover damages because he assumed the risk by being there,⁸⁶

⁸⁴ See, *Barr, supra*, (poor design) and *Curtis v. Dewey, supra*, (poor maintenance procedures).

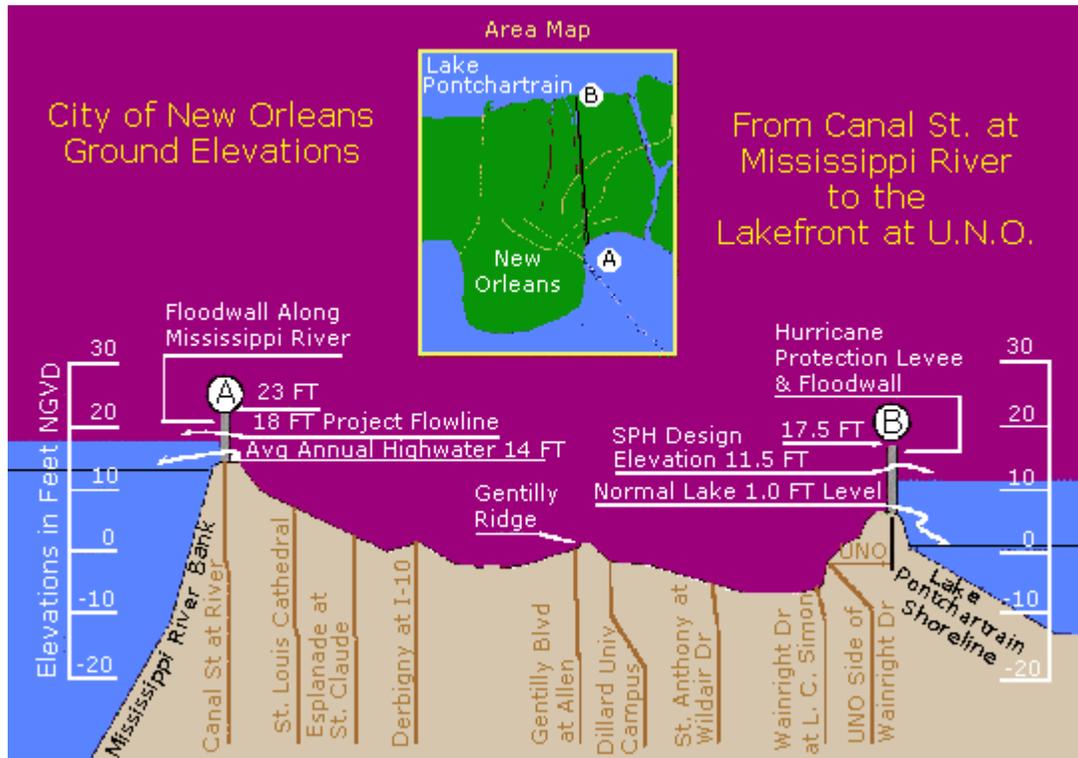
⁸⁵ See, *Wheatland Irrigation District, supra* at pp 1132-1136 for a thorough discussion of this matter.

⁸⁶ Prosser, *Selected Topics, supra* p. 184.

there is at least a possibility that a good defense can be made if someone locates in an area that will be flooded due to the failure of a water control structure.

The national program that publishes maps of all known flood hazards in the United States⁸⁷ does not examine or consider the possibility of dam failure in preparing its maps, which are designed to be relied upon by those who build in flood hazard areas.⁸⁸ In view of this, it would seem unreasonable to require even the most sophisticated builders to analyze the consequences of the failure of a dam on another person's property prior to building on their own property. However, there is some support in a recent Iowa case that construction in a high risk area below a dam could be a nuisance, requiring a downstream mobile home park be removed rather than the dam modified.⁸⁹

D. Statutory Privilege



Vertical cross section of the New Orleans area. Image credit: US Army Corps of Engineers, New Orleans District.

⁸⁷ National Flood Insurance Program 42. U.S.C. §§ 4001-4128

⁸⁸ Interview with J. Murphy, P.E. of Michael Baker, Inc. October 28, 2005.

⁸⁹ See, *Easter Lake Estates, Inc. v. Polk County*, 444 N.W.2d 72; 1989 Iowa Sup. LEXIS 194.

If an activity is authorized to be carried out by statute or when the law requires that the activity be carried out, strict liability will not be imposed without a showing of negligence due to the doctrine of statutory privilege.⁹⁰ The United States government has statutory immunity from suit for all its flood control activity.⁹¹ This immunity from suit includes failure of both flood control levees and flood control dams, as well as activities necessary to operate these facilities for flood control purposes.⁹² This immunity does not extend to Federal facilities for purposes other than flood control.⁹³ In addition, in the aftermath of hurricane Katrina, there are numerous lawsuits threatened, and already filed which will attempt to demonstrate that the protections of the United States Constitution for Due Process, Equal Protection and protection of property from taking without just compensation trump any Federal statutory immunity with respect to statutory immunity for damages from flood control facilities.⁹⁴

Although many states require that a person obtain a license to operate or construct a dam, I have been unable to find direct case law or a specific basis on any of these statutes for a belief that the licensing of a dam provides a form of statutory immunity. However, I would certainly raise statutory immunity as a defense in a case involving strict liability, particularly in a case where there was a license from a state to carry out a public service such as electric production or provision of water supply.⁹⁵

⁹⁰ Prosser, *Torts* pp. 465-466 (1941). This doctrine is often applied to “escapes” of gas, electricity, or water from pipes or conduits under city streets. See, however *Pacific Bell v. City of San Diego*, 81 Cal. App. 4th 596, 96 Cal.Rptr. 2d. 897 (2000) where strict liability was imposed with respect to the failure of a City-owned water pipe.

⁹¹ 33 U.S.C. §702(c) states: “No liability of any kind shall attach to or rest upon the United States for any damage from or by floods or flood waters at any place.” This provision was enacted into law in order to encourage the creation of flood control works.

⁹² *Industrial Indem. Ins. Co. v. United States*, 757 F.2d 982, 1985 U.S. App. LEXIS 30028 (9th Cir. Idaho 1985).

⁹³ *Graci v. United States*, 456 F. 2d 20 (5th Cir. 1971); noted with approval in *Unites States v. James*, 478 US 597 (1986) at fn 2 p. 601.

⁹⁴ See, e.g. Insurance Journal, Hurricane Katrina: The Legal Saga Begins, September 19, 2005.

⁹⁵ A Minnesota court held that the importance of a dam providing public power permitted the court to find that the doctrine of strict liability was not applicable. The court, however, permitted the use of the *res ipsa loquitur* so the defendant still had to show he was not negligent. See, *City Water Power Co. v. Fergus Falls*, 113 Minn. 33, 128 N.W. 817 (1910).



Oblique view of the (south) levee break at the Inner Harbor Navigation Canal into the lower Ninth Ward. Image credit: Leslie F. Harder for American Society of Civil Engineers.

VI. Conclusions

Strict liability for damage caused by the release of water from a water control facility is the general rule of law in the United States. The roots of the doctrine of strict liability for the failure of water control facilities are deep and pervasive. Looking at the doctrine in an historical context, the willingness of some United States courts to hold that a plaintiff must prove negligence in order to recover for damage done by water escaping from a failed water control facility is strongly influenced by public policy to encourage the needed supply of water⁹⁶, or to encourage the construction of flood control facilities. The modern trend back towards a “*Rylands*

⁹⁶ Sheldon, *supra* at 201, *Ramada Inns, Inc. v. Salt River Valley Water Users' Association*, [111 Ariz. 65, 523 P.2d 496](#) (1974), and *Paterno v. State*, 123 Cal. App. 4th 548; 20 Cal. Rptr. 3d 282, (Cal.App.4th) (2004).

rule” of strict liability is certainly influenced by the twentieth century tendency of courts and legislature to be more concerned with compensating victims than with litigating “fault.” A good illustration of this trend is a recent California case, where the state was found liable for the failure of a levee. While the court did not impose “strict liability” *per se*, the court’s reasoning imposed a standard very similar to it.⁹⁷ Despite the alleged existence of a “crisis” in the availability of liability insurance in the United States,⁹⁸ which some groups suggest could be alleviated by reform of the tort laws, moving away from a system of “no fault” victim compensation towards a



Approved Site Plan for the former Safari Hotel site, which was damaged by flooding from the adjacent canal in 1971-72. Image credit: City of Scottsdale, Arizona.

⁹⁷ Sheldon, *supra* at 201, *Ramada Inns, Inc. v. Salt River Valley Water Users' Association*, 111 Ariz. 65, 523 P.2d 496 (1974), and *Paterno v. State*, 123 Cal. App. 4th 548; 20 Cal. Rptr. 3d 282, (Cal.App.4th) (2004).

⁹⁸ *Sorry Your Policy is Cancelled*, Time Magazine, March 24, 1986, p. 16 *et seq.*

fault-based negligence system.⁹⁹ I do not believe that the trend towards strict liability for water facility failure will be reversed, except possibly in situations like that faced in Arizona, where the provision of water through water control facilities such as the Central Arizona Project, is necessary to support life itself.¹⁰⁰

Unlike more recent “no fault” systems of insurance for compensating victims, strict liability for dam failures has deep historical roots, and reflects the reality that a potential victim of flooding due to dam failure would have a great deal of practical difficulty in obtaining insurance in order to spread his risk among other potential victims.¹⁰¹ In addition, like other “no fault” systems such as Worker’s Compensation, strict liability has the great advantage that it encourages negotiated settlements rather than lawsuits, thus relieving a burden on the court system,¹⁰² and allowing a greater percentage of the premium income to be paid the damaged party.¹⁰³

In addition, strict liability can serve as a powerful deterrent to unsafe water control facilities since large insurance companies increasingly reduce loss by identifying potential claim-generating problems and requiring that the problem be solved as a condition of writing or renewing a liability policy.¹⁰⁴

From the perspective of a water control facility owner, the outlook is not as grim as it might seem at first glance. Failure of a major water control facility during a storm is likely to lead to the imposition of strict liability. However, advances in hydrology and hydraulics offer protection to the water control facility owners as well

⁹⁹See, e.g., Testimony of Former Administrator of the United States Federal Insurance Administration, Jeffrey S. Bragg, before Committee on Commerce, Science, and Transportation, United States Senate, pp. 8-12 (1986).

¹⁰⁰ See, *Ramada Inns, Inc. v. Salt River Val. Wat. Users’ Ass’n*, 111 Ariz. 65 (1974).

¹⁰¹ Flood Insurance is available in every community that participates in the National Flood Insurance Program. Though flood insurance is available throughout the participating community, it is more commonly sold in areas identified as “special flood hazard areas.” Areas protected by levees from a flood having a 1% annual chance of occurrence, including required freeboard and maintenance are not considered “special flood hazard areas”. See, 44 *CFR* 65.10. In addition, the issuer of a policy of flood insurance may pursue a subrogation remedy against the water control facility owner, thus bringing us full circle back to owner’s liability.

¹⁰² See, J. O’Hara, *Case Comments*, 4 Fla. St. U.L. Rev. 304, 313.

¹⁰³ Sheldon, *supra*, at 198.

¹⁰⁴ *Id.* at 204.

as to the public at large. Investigations of potential for failure undertaken by the owners of water control facilities before that failure may well provide an owner with the unwelcome and unpleasant news about the safety of these facilities. At the same time, awareness of any deficiencies should give early warning of problems while they can be corrected.