

**UNITED STATES DISTRICT COURT  
DISTRICT OF CONNECTICUT**

HARLEYSVILLE WORCESTER INS.  
CO.,

Plaintiff,

v.

PARAMOUNT CONCRETE, ET AL.,  
Defendants.

No. 3:11-cv-578 (SRU)

**MEMORANDUM OF DECISION**

This is an insurance coverage action relating to claims for damage to swimming pools constructed with defectively produced concrete, known as “shotcrete.” Plaintiff Harleysville Worcester Insurance Company (“Harleysville”) brought this declaratory judgment action pursuant to 28 U.S.C. §§ 2201 and 1332(a)(1), against Paramount Concrete (“Paramount”), R.I. Pools, and Paramount’s excess liability insurer, Scottsdale Insurance Company, seeking a declaration that it has no duty to indemnify Paramount in underlying litigation brought by R.I. Pools. *See* Compl. (doc. # 1). On March 31, 2014, I issued a ruling granting summary judgment in favor of Paramount and R.I. Pools in substantial part, except with respect to the issue whether Paramount was excluded from coverage because it “expected or intended” its shotcrete to fail. A bench trial was held from December 1 to December 2, 2014, during which Harleysville, Paramount and R.I. Pools presented evidence on that issue.

For the reasons set forth below, I conclude that Harleysville has not proven by a preponderance of the evidence that Paramount “expected or intended” its shotcrete to fail. My findings of fact and conclusions of law are set forth below.

## **I. Background and Procedural History**

In May 2009, R.I. Pools commenced a products liability lawsuit in Connecticut Superior Court against Paramount, a manufacturer and supplier of shotcrete, after approximately nineteen pools built by R.I. Pools and incorporating Paramount's shotcrete developed significant, detrimental cracks. The case went to trial and on February 17, 2011, the jury returned a verdict in favor of R.I. Pools, awarding compensatory damages of \$2,760,207.90. The jury also found that R.I. Pools was entitled to punitive damages, because Paramount acted "with a reckless disregard for the safety of product users, consumers and others who were injured by the product." Subsequently, the court awarded punitive damages in the form of attorneys' fees.<sup>1</sup>

Paramount was insured under a Commercial General Liability ("CGL") insurance policy issued by Harleysville. The CGL policy obligates Harleysville to defend any claim and indemnify any judgment against Paramount if the cause of action is covered by the policy. Included in the scope of coverage is "property damage" caused by an "occurrence," which the policy defines as "an accident, including continuous or repeated exposure to substantially the same harmful conditions." The policy compensates Paramount for up to one million dollars in damages per occurrence, and two million dollars total. Harleysville defended Paramount in its litigation with R.I. Pools, but reserved the right to contest coverage in the event of an unfavorable judgment.

Shortly after the verdict in the underlying litigation, Harleysville filed this declaratory judgment action, primarily asking the court to rule: (1) Paramount's insurance policy did not provide coverage for the damages awarded in the underlying litigation; and (2) even if it did, several exclusions nevertheless barred coverage. Compl. ¶¶ 31-34. Paramount filed a

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<sup>1</sup> On May 6, 2014, the Connecticut Appellate Court affirmed the jury's verdict, but reversed and remanded to the Superior Court with respect to the calculation of damages. *See R.I. Pools, Inc. v. Paramount Concrete, Inc.*, 149 Conn. App. 839 (2014).

counterclaim also seeking a declaratory judgment, as well as damages for Harleysville's alleged bad faith defense in the underlying action and violations of the Connecticut Unfair Trade Practices Act. Am. Countercl. (doc. # 59).

Paramount and R.I. Pools moved for summary judgment on the declaratory judgment claims. On March 31, 2014, I granted those motions in substantial part, ruling that there were no genuine issues of material fact and Paramount and R.I. Pools had established coverage as a matter of law. To summarize, Paramount's policy requires Harleysville to pay "those sums that [Paramount] becomes legally obligated to pay as damages" because of "property damage" caused by an "occurrence" that takes place in the "coverage territory" during the policy period. CGL Policy, section I.1(a)-(b) (doc. # 82-3); *see also* Pl.'s Ex. 60. The policy defines an "occurrence" as "an accident, including continuous or repeated exposure to substantially the same general harmful conditions." *Id.*, section V.13. "Accident" is not defined, but the Connecticut Supreme Court has interpreted this term to mean "an unforeseen unplanned event" "occurring without intent or volition" and "producing an unfortunate result." *Vermont Mut. Ins. Co. v. Walukiewicz*, 290 Conn. 582, 594 (2009) (citing *Safeco Ins. Co. of America v. Tunkle*, 997 F. Supp. 1356, 1357 (D. Mont. 1998)); *see also Hammer v. Lumberman's Mut. Cas. Co.*, 214 Conn. 573, 590 (1990) (an accident is "an unintended occurrence"); *Commercial Contractors Corp. v. Am. Ins. Co.*, 152 Conn. 31, 42 (1964) (an accident is "an unexpected happening").<sup>2</sup>

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<sup>2</sup> The "accident" is "the event causing injury, not the cause of that event." *Commercial Contractors*, 152 Conn. at 42-43. Therefore, in determining whether an "occurrence" has taken place, Connecticut courts look to the last event in the causal chain causing injury. *Metropolitan Life Ins. Co. v. Aetna Cas. & Sur. Co.*, 255 Conn. 295, 312 (2001). The phrase "continuous exposure" broadens the term "occurrence" "beyond the word 'accident' to include a situation where damage occurs (continuously or repeatedly) over a period of time," rather than suddenly or instantaneously, as the word "accident" typically suggests. *Id.* at 307-08 (quoting *Champion Int'l Corp. v. Continental Cas. Co.*, 546 F.2d 502, 507-08 (2d Cir. 1976) (Newman, J., dissenting)). It covers "claims that occur 'when people or property are physically exposed to some injurious phenomenon such as heat, moisture, or radiation . . . [at] one location.'" *Id.* at 311. The phrase, however, does not eliminate the requirement of a causal chain – i.e., the "property damage" cannot itself be the "occurrence" for which the insured seeks coverage. *Jakobson Shipyard, Inc. v. Aetna Cas. & Sur. Co.*, 961 F.2d 387 (2d Cir. 1992); *Providence Washington Ins. Grp. v. Albarello*, 784 F. Supp. 950 (D. Conn. 1992).

The policy defines “property damage” as “[p]hysical injury to tangible property, including all resulting loss of use of that property.” CGL Policy, section V.17. Where an insured “unintentionally sells a defective product that is incorporated into a third-party’s finished product, the resulting impairment to the third-party’s product” constitutes an “occurrence” that causes “property damage.” *Chubb Ins. Co. of N.J. v. Hartford Fire Ins. Co.*, No. 97 CIV. 6935 LAP, 1999 WL 760206, at \*4 (S.D.N.Y. Sept. 27, 1999), *aff’d*, 229 F.3d 1135 (2d Cir. 2000) (incorporation of impure juice concentrate into juice drink was “occurrence” causing “property damage” because tainted concentrate made finished drink impure); *see also, e.g., Maryland Cas. Co. v. W.R. Grace & Co.*, 23 F.3d 617, 624-27 (2d Cir. 1993) (installation of asbestos in buildings was an “occurrence”); *Aetna Cas. & Sur. Co. v. Gen. Time Corp.*, 704 F.2d 80 (2d Cir. 1983) (incorporation of defective motor into radiator valve that caused valve to malfunction was an “occurrence”); *Nat. Union Fire Ins. Co. of Pittsburgh v. Terra Ind., Inc.*, 216 F. Supp. 2d 899, 918-19 (N.D. Iowa 2002); *Shade Foods, Inc. v. Innovative Products Sales & Mktg., Inc.*, 78 Cal. App. 4th 847, 865 (2000). Paramount’s defective shotcrete was incorporated into R.I. Pools’ finished products, the pools, and caused those products to fail. As a result, I ruled on summary judgment that Paramount met its burden of proving “property damage” caused by an “occurrence,” and thus established coverage. *See Harleysville Worcester Ins. Co. v. Paramount Concrete, Inc.*, 10 F. Supp. 3d 252, 263 (D. Conn. 2014).

The burden then shifted to Harleysville to prove that one of the policy’s enumerated exclusions barred coverage. Harleysville urged the applicability of Exclusion a, which precludes coverage for injuries “expected or intended” by the insured. Harleysville also argued that several “business risk” exclusions designed to prevent an insurer from becoming a surety for the

insured's defective work or product applied in this case. *See, e.g., Bonded Concrete, Inc. v. Transcon. Ins. Co.*, 784 N.Y.S.2d 212, 213 (3d Dep't 2004).

The business risk exclusions ensure that a CGL policy covers “tort liability resulting from the product and/or work of the insured company” without serving as a warranty on the quality of the work or product itself. *Am. Ins. Co. v. Crown Packaging Int'l*, 813 F. Supp. 2d 1027, 1046 (N. D. Ind. 2011); *Fireman's Fund Ins. Co. v. Amstek Metal, LLC*, No. 07 C 647, 2008 WL 4066096 (N.D. Ill. Aug. 27, 2008). I concluded that none of those exclusions applied, because the underlying state-court trial established that Paramount sought coverage for damage caused by its product, not for the cost of remedying the defective product itself. With respect to the “expected or intended” injury exclusion, however, I held that Harleysville should not be bound by the record at the underlying trial. The jury did not need to consider Paramount's subjective state of mind in order to hold Paramount liable to R.I. Pools; therefore, the jury's determination that Paramount acted recklessly neither established nor precluded a finding of “expected” or “intended” injury as a matter of law. Thus, I concluded that it was necessary to have a bench trial on the issue. *See Paramount Concrete*, 10 F. Supp. 3d at 265.

## **II. Findings of Fact**

### **A. Properties of Concrete**

In its most basic form, concrete is the combination of water, cement (typically Portland cement), and aggregate – i.e., sand and rock. Chemical additives, or “admixtures,” can also be added to reduce water, accelerate or slow down the hardening process, control shrinkage, and entrain air. Pl.'s Ex. 40A at 1; Pl.'s Ex. 49A at 4; Bench Trial (Dec. 1, 2014) Tr. at 30:7-21. Shotcrete is a special type of concrete that is not cast, but is put into a hopper and then shot into

placed at high velocity through a hose.<sup>3</sup> Bench Trial (Dec. 1, 2014) Tr. at 31:4-25. Shotcrete is more difficult to work with than regular concrete; it starts hardening faster due to its high cement content and needs to have a more uniform consistency than ordinary concrete. Pl.’s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 23:3-10). Properly placing shotcrete into the pump for shooting is also difficult, and requires a degree of precision. *Id.*

Concrete is formed when the water and cement undergo a chemical reaction called “hydration,” forming a paste that binds the aggregates together and fills the space between the aggregate particles. In properly made concrete, each particle of aggregate is completely coated with paste and all spaces between the particles are completely filled with paste. Pl.’s Ex. 40A at 1-2; Pl.’s Ex. 49A at 4, 133. The quality of the paste and characteristics of the aggregates therefore significantly impact the quality and durability of the concrete.

Paste quality affects both workability and strength. The quality of the paste depends on the water/cement ratio, the suitability and compatibility of the cementitious materials and admixtures used, and the extent of “curing,” – a process that permits hydration to proceed slowly, which helps maximize the strength of the concrete.<sup>4</sup> Pl.’s Ex. 40A at 1-2; Pl.’s Ex. 49A at 11-19. Freshly poured concrete should be a plastic, workable mixture, with a slump of two to three, but not more than five inches.<sup>5</sup> *See id.*; Pl.’s Ex. 49A at 12-14, 66. Sufficient but not excessive amounts of water and cement are necessary to achieve the desired slump and maximize

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<sup>3</sup> In the case of a swimming pool, shotcrete would be shot directly into the pool shell – a hole in the ground with steel reinforcement, embedded materials, piping and fixtures. Bench Trial (Dec. 1, 2014) Tr. at 31:4-25.

<sup>4</sup> “Curing” is important because the hydrating cement particles form crystals that interlock with each other and attach to the aggregates – these crystalline structures keep growing and expanding even after the concrete initially hardens, which is why concrete gets harder over time. Pl.’s Ex. 40A at 2. At normal temperatures, seven days of curing is typically adequate. *See id.*

<sup>5</sup> “Slump” is a term that describes the consistency of fresh concrete and the “slump test” empirically measures workability. Concrete is placed in a cone and then the cone is removed and put to the side. Without the cone to keep it in place, the concrete sinks somewhat. The difference between the height of the cone and the height of the free-standing concrete is the slump. The higher the slump, the more fluid the concrete is; the lower the slump, the more rigid the concrete is. Pl.’s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 20:9-21:23).

workability. Pursuant to “Abrams’ law,” for a mixture of workable consistency, the strength of the concrete is dependent on the ratio of water to cement; the lower the water/cement ratio the higher the strength of the concrete and the less prone it will be to cracking. *Id.* at 22-23; Pl.’s Ex. 40A at 1; Bench Trial (Dec. 1, 2014) Tr. at 32:6-21. A water/cement ratio of between .4 and .5 should produce concrete that has a compressive strength of at least 4,000 pounds per square inch (“psi”) when it hardens. Pl.’s Ex. 49A at Figure 1-2.

Aggregates used in concrete are concrete sand,<sup>6</sup> gravel, crushed stone, crushed slag and manufactured products. Pl.’s Ex. 49A at 89. The particle shape and surface texture of aggregates influences both workability and strength. *Id.* at 14, 89-91; Pl.’s Ex. 40A at 58-60; Bench Trial (Dec. 1, 2014) Tr. at 25:17-26:1. Because it is necessary to minimize the water content in order to maximize strength and reduce cracking, it is important to minimize the surface area of the aggregate particles as well, so that less water and cement are required to fully coat them. *Id.* Concrete mixes that utilize smooth, rounded aggregates typically produce better concrete than mixes that have more rough-textured or flat and elongated particles. *Id.*

Grading of the aggregate particles is also important. An excess of fine sands will increase water demand, reducing strength. Conversely, an excess of coarse sands may produce harsh, unworkable concrete that bleeds excessively. *Id.* Poorly graded aggregate can negatively impact the uniformity of concrete, which is problematic, because non-uniformity produces concrete of variable strengths, which may cause shrinking and cracking.<sup>7</sup> *Id.*

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<sup>6</sup> Concrete sand is generally a fluvial sand from a riverbank that is specially processed in a manufacturing facility, which removes silt and other fine materials, clay, and any coatings on the material. Bench Trial (Dec. 1, 2014) Tr. at 33:23-34:4.

<sup>7</sup> Non-uniform concrete can cause problems even if all areas are technically “strong” – e.g. “superhuman” 20,000 psi alongside 10,000 psi. Pl.’s Ex. 64 (Underlying Trial [Feb. 10, 2011] Tr. at 90:10-17; 91:5-22); Bench Trial (Dec. 2, 2014) Tr. at 192:3-7 (large standard deviation in compressive strength necessarily indicates issues with tensile strength, even if all concrete is technically “strong.”).

Compressive strength is a key basis for judging the quality of concrete; concrete that fails to develop its expected strength likely is deficient in other ways as well. Pl.'s Ex. 49A at 19. As discussed above, the quality of the paste, grading of the aggregate, appropriate use of admixtures, and curing conditions affect both uniformity and strength. Other factors that impact strength and uniformity include: (1) the methods followed in handling and placing the concrete; (2) the age of the concrete when placed; and (3) temperature. *Id.* at 22; *see also* Defs.' Ex. A7 (Underlying Trial [Feb. 15, 2011] Tr. at 152:3-13).

Concrete typically achieves 80% of its compressive strength within twenty-eight days, though well-made concrete will continue to gain strength for months or even years. Pl.'s Ex. 40A at 1-2; Pl.'s Ex. 49A at 4. Although it is up to the customer to determine desired strength, the building code requires concrete to have a minimum twenty-eight day compressive strength of 2,500 psi. To satisfy the code requirement, no single sample can have a strength of less than 75% of 2,500 psi and no set of three samples can have a strength of less than 85% of 2,500 psi. Bench Trial (Dec. 1, 2014) Tr. at 32:10-13, 134:19-23; Bench Trial (Dec. 2, 2014) Tr. at 192:8-23, 203:9-13, 204:11-15.

On its own, concrete is relatively weak in tensile strength compared to compressive strength. Concrete cracks because the tensile force pulling it apart – primarily due to shrinkage – is greater than the tensile strength of the concrete. Pl.'s Ex. 49A at 48, 57, 59; *see also* Bench Trial (Dec. 1, 2014) Tr. at 101:14-16. Concrete is often reinforced with steel, which increases tensile strength and helps to distribute shrinkage stress more evenly.<sup>8</sup> Pl.'s Ex. 49A at 48. Increased compressive strength is accompanied by greater tensile strength, so measures designed to increase compressive strength will also help concrete resist cracking. *Id.* at 59-60.

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<sup>8</sup> It is important to correctly place reinforcing bars; a reinforcing bar that is too close to the surface, for example, can itself cause cracks in the concrete. Pl.'s Ex. 49A at 59.

The cause of distress or failure of concrete can rarely be traced to one factor; it usually results from several contributing causes including unsuitable materials, improper workmanship or the environment. Pl.'s Ex. 49A at 6. Changes in temperature and moisture content commonly play a major role in shrinkage-related cracking, because they cause concrete to shrink and swell. Pl.'s Ex. 49A at 47-48, 57-62. Shrinking and swelling caused by freeze/thaw cycles can be particularly destructive, because water in concrete expands as it freezes, which puts pressure on the concrete that can cause it to rupture. Pl.'s Ex. 49A at 61. Cracks that develop from freeze/thaw cycles are damaging and progressive. They generally result "from failure to provide quality concrete when the structure was built." *Id.* Low water content, sound aggregates and adequate curing increase resistance to freeze/thaw cycles. *Id.* at 45.

Entraining air into fresh concrete (typically through an air-entraining admixture) also helps improve concrete's resistance to freeze-thaw exposure. Entrained air voids act as reservoirs for excess water, thus relieving pressure caused by freezing and preventing damage to the concrete. *Id.* at 14-15, 134; Pl.'s Ex. 40A at 61. Air-entrained concrete with a compressive strength over 4,000 psi usually can withstand numerous cycles of freezing and thawing without major cracking.<sup>9</sup> Pl.'s Ex. 40A at 2. Air entrained mixtures are finicky, however, and need to be checked frequently to make sure the air content is within the desired range. Proper mixing is critical, in order to obtain a uniform distribution of entrained air voids. *Id.* at 62.

#### B. Paramount Concrete

The Vona family and Steve Riviere co-owned Paramount Stone, a successful stone masonry business operating in Fairfield County. Paramount Concrete came into being in 2005, when Riviere and the Vonas decided to open a concrete plant. Pl.'s Ex. 64 (Riviere Dep. 106:14-

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<sup>9</sup> Air entrainment negatively impacts strength, making it difficult to achieve concrete with a strength over 5,000 psi. An air entrained mixture, however, will have a lower water content at the same slump, which helps minimize the impact of the reduced strength. Pl.'s Ex. 40A at 61.

24). Carlo and Grace Vona contributed approximately \$1.5 million to the project and their son, Richard Vona, worked with Riviere to get the concrete plant up and running.<sup>10</sup> Bench Trial (Dec. 2, 2014) Tr. at 234:10-23.

Neither Richard Vona nor Riviere had any prior experience running a concrete plant. *Id.* at 220:12-221:9; Pl.’s Ex. 64 (Riviere Dep. 109:6-18, 116:6-7, 117:10-20). Before opening Paramount Concrete, Richard Vona researched concrete plants online and visited several plants in the area. He consulted with concrete manufacturers and other industry personnel for advice on various aspects of concrete production, and asked some of those individuals to walk through the site for Paramount’s plant. Richard Vona also attended the “World of Concrete” trade show in Las Vegas. Pl.’s Ex. 64 (Underlying Trial [Feb. 9, 2011] Tr. at 28:6-21).

There are only a few companies in the country that regularly manufacture concrete batch plants (i.e., the machines that make concrete). Richard Vona consulted with the Concrete Manufacturers Bureau of the National Ready Mix Concrete Association of America (“NRMCA”), the trade organization that supports the sale and manufacture of ready-mix concrete, to determine which of those companies to purchase a batch plant from.<sup>11</sup> After consulting with the NRMCA, Richard Vona decided to purchase a plant from the Vince Hagen Company. Pl.’s Ex. 64 (Underlying Trial [Feb. 9, 2011] Tr. at 28:22-29:3). At the December 2014 bench trial, Harleysville’s expert, Geoffrey Hichborn, testified that the Vince Hagen company has a reputation of building “satisfactory intermediate grade plants” that are “solid,” but not “premier.” Bench Trial (Dec. 1, 2014) Tr. at 42:6-16. Vince Hagen erected Paramount’s plant and sent a technician to help get it up and running. Pl.’s Ex. 64 (Riviere Dep. 91:18-27,

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<sup>10</sup> Steve Riviere owned approximately 33% of Paramount Concrete and Grace Vona owned the remaining interest. Grace Vona ostensibly was a corporate officer, but Paramount never held any board meetings and Grace Vona was completely uninvolved with the operation of Paramount concrete.

<sup>11</sup> The NRMCA is the “go-to” agency in the ready-mix industry. It promulgates standards for mixture trucks, batching, mixing, and conveying the preparation of mix designs. Bench Trial (Dec. 1, 2014) Tr. at 45:1-9.

184:7-15, 185:1-15). Paramount Concrete had copies of the Vince Hagen manuals in its possession at all times. Pl.'s Exs. 31A, 35A.

Paramount's plant, like most concrete plants in the United States, was a "dry batch plant." That means that all of the ingredients were batched into the truck dry and the concrete was mixed in the truck. Bench Trial (Dec. 1, 2014) Tr. at 38:6-39:24; Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 37:6-21). The plant operator, or "batchman," would input mix designs into a computerized batching system based on the desired number of cubic yards of concrete and the batching system would add the appropriate ingredients in the right proportions. Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 28:14-16, 36:6-17); Bench Trial (Dec. 1, 2014) Tr. at 42:25-43:12; Defs.' Ex. A2 (Kavanaugh Dep. 36:2-14). The batching system was not particularly difficult to operate; it only took a day or two to learn how to run the batch operation. Pl.'s Ex. 64 (Riviere Dep. 123:13-16). Paramount kept the manuals for the batching system next to the system's control panel, so the batchman would always have access to them. *Id.* at 123:17-2; *see also* Pl.'s Exs. 29A, 30A, 34A.

Richard Vona's research was limited to developing the plant, not overseeing its operation. He did not learn how to make concrete or research quality control issues. Bench Trial (Dec. 2, 2014) Tr. at 272:10-13. Once the plant was up and running, Richard Vona largely disengaged. Richard Vona played no role in the management of the plant, rarely visited, and generally did not keep track of the goings on at Paramount Concrete. *Id.* at 221:10-222:13. Riviere was in charge of day-to-day operations at Paramount from the time it opened until he left the company in April 2009.<sup>12</sup> *Id.* at 222:14-18; Pl.'s Ex. 64 (Underlying Trial [Feb. 9, 2011] Tr. at 16:1-2). Riviere received no formal or semi-formal training on how to make concrete, spot

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<sup>12</sup> Riviere was also responsible for operational control of Paramount Stone. Bench Trial (Dec. 2, 2014) Tr. at 222:14-18.

quality control issues, or operate a concrete plant. To prepare himself for the job, Riviere read up on the concrete-making process and plant operations, and also worked with testing laboratories to learn how to test concrete. Pl.'s Ex. 64 (Riviere Dep. 88:4-5, 118-120:4, 224:22-24); Defs.' Ex. A3 (Riviere Dep. 116:21-27).

John "Red" Kavanaugh was the batchman at Paramount during the relevant period. Pl.'s Ex. 64 (Underlying Trial [Feb. 9, 2011] Tr. at 19:9-15). Kavanaugh was trained by his predecessor, Bob Kovaleski, who had been trained by the Vince Hagen technician.<sup>13</sup> Pl.'s Ex. 64 (Riviere Dep. 195:19-25); Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 30:17-21). In addition to the on-the-job training he received from Kovaleski, Kavanaugh attended a training session at the "World of Concrete" trade show and attended two of three sessions of an American Concrete Institute ("ACI") course, though he never took the test associated with the course. Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 31:8-32:14, 32:16-23, 57:12-19); Pl.'s Ex. 17. Kavanaugh also occasionally reached out to a representative at Sika Corporation, one of the world's largest suppliers of chemical products, to obtain guidance and borrow books on admixtures for concrete. Defs.' Ex. M2 (Kavanaugh Dep. 39:10-40:17).

Kavanaugh, however, wanted more training and complained that Riviere denied his requests to take an advanced ACI course, due to cost. *See id.* Kavanaugh did not feel that his training was complete when he started as a batchman; he knew *what* he was doing, but did not necessarily understand *why*. *Id.* at 30:24-31:3, 33:12-23. Kavanaugh worked at Paramount for approximately two and a half years. Riviere terminated Kavanaugh's employment in 2007, after

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<sup>13</sup> Riviere hired Kovaleski because he had done good work for Riviere as a welder in the past and Riviere thought he would be a good batchman as well. Pl.'s Ex. 64 (Riviere Dep. 193:17-194:6).

customers reportedly complained about their interactions with him.<sup>14</sup> Defs.' Ex. A3 (Riviere Dep. 124:14-125:7). Riviere testified that Kavanaugh's termination was unrelated to his performance as a batchman and that aside from his tendency to argue with customers, Kavanaugh was good at his job. Pl.'s Ex. 64 (Riviere Dep. 125:2-17, 209:22-24).

### C. Quality Control at Paramount Concrete

Paramount Concrete was never a profitable company, and Riviere and Kavanaugh regularly discussed (and often disagreed about) ways to make more efficient mixes that minimized cost without compromising quality. Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 66:18-67:6). Paramount Concrete had no formal quality control process or procedures in place and Riviere did not oversee the production process. Quality control was an informal affair that was left to the batchman and the drivers. Pl.'s Ex. 64 (Underlying Trial [Feb. 9, 2011] Tr. at 86:8-13); Pl.'s Ex. 64 (Riviere Dep. 115:2-116:5). In the course of Kavanaugh's tenure as batchman, several quality control-related issues arose that might have impacted Paramount's product.

First, although Paramount's water system was brand new, the system's water valve often malfunctioned – inexplicably failing to open or close. Defs.' Ex. A4 (Underlying Trial [Feb. 9, 2011] Tr. at 33:2-9); Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 38:1-39:24). Kavanaugh testified at his deposition that he and Riviere undertook various efforts to fix the water valve, but new problems continually arose. Defs.' Ex. M2 (Kavanaugh Dep. 61:22-63:13).

A malfunctioning water valve had the potential to cause serious problems, because water plays such a crucial role in the production of uniform, quality concrete. Bench Trial (Dec. 1, 2014) Tr. at 103:22-104:12. Too much water would have decreased the concrete's strength, too

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<sup>14</sup> Kavanaugh testified that his termination came as a surprise and that, despite Riviere's stated explanation, he never understood why he was fired or felt like he received an adequate explanation. Defs.' Ex. A2 (Underlying Trial [Feb. 7, 2011] Tr. at 82:22-83:10); Defs.' Ex. M2 (Kavanaugh Dep. 97:10-98:2).

little water would have negatively impacted workability, and inconsistent amounts of water would have produced non-uniform concrete. *See id.*; *see also* Pl.’s Ex. 49A at 22; Pl.’s Ex. 64 (Riviere Dep. 172:15); Pl.’s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 19:27-20:2). But Kavanaugh believed that the malfunctioning water valve had little to no effect on the quality of Paramount’s concrete. Defs.’ Ex. M2 (Kavanaugh Dep. 63:5-13, 63:24-65:14); Pl.’s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 40:18-25). The batchman’s console had a meter that told him how much water had gone through the valve, even when the valve was malfunctioning, and Kavanaugh would also “eyeball” the amount of water going in and inspect the concrete to make sure that the mixture had the right amount of water. Although this method was “kind of haphazard,” it was not inaccurate. *Id.*; Pl.’s Ex. 64 (Kavanaugh Dep. 72:11-73:1). Kavanaugh had a “very good” idea of what concrete was supposed to look like and could tell through inspection if the water content of the mix was within an appropriate range. *Id.* If not, it was easy to correct the proportions of the other materials to ensure that the mix was properly constituted. Defs.’ Ex. M2 (Kavanaugh Dep. 64:17-65:14).

Second and relatedly, Paramount, did not have a moisture meter to detect the water content of its shotcrete mix. To consistently produce concrete with the desired slump, the plant operator needs to assess and apply corrections for moisture before a batch is produced; a small variation in sand moisture can have a major effect on concrete’s water content and consistency. Pl.’s Ex. 40A at 27-28. Many concrete batch plants are equipped with moisture meters, which assist the batchman by measuring the moisture content of the sand and other aggregates that go into the concrete. *Id.* at 27.

Without a moisture meter, Paramount relied on manual inspection to test the moisture content of the aggregate and the concrete mix. Pl.’s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr.

at 64:12-65:6). Kavanaugh was not formally trained in this regard, but he learned how to manually inspect the sand by reading a book. Pl.'s Ex. 64 (Kavanaugh Dep. 74:3-7). He likened this method to testing a steak with your fingers to determine whether it is done. *See id.*; *see also* Defs.' Ex. A3 (Riviere Dep. 139:15-22, 141:5-142:16) (noting that they would get a slump reading and adjust the water content of mixture based on the moisture of the sand – e.g., they added less water if it was raining).

Kavanaugh acknowledged that using a moisture meter would have produced more accurate results than manual inspection. Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 65:7-25); Pl.'s Ex. 64 (Kavanaugh Dep. 74:8-10). Concrete plants, however, are not required to have moisture meters and Vona testified that approximately 60% of small concrete plants in the United States do not have them. Pl.'s Ex. 64 (Underlying Trial [Feb. 14, 2011] Tr. at 148:9-12). Paramount eventually purchased one in 2008, during the process of getting the plant state-certified.<sup>15</sup> Pl.'s Ex. 64 (Riviere Dep. 139:11-14).

Third, Paramount used trucks from the 1980s, which often experienced issues due to age and overuse. Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 84:9-27). In particular, the mixing fins in the trucks were worn out and fins occasionally would break and come out of the trucks. *Id.* at 23:27-24:17, 61:25-27, 67:11-15; Pl.'s Ex. 64 (Riviere Dep. 215:25-216:1). Worn and broken fins made it difficult to mix and deliver uniform, quality concrete. Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 61:18-24); Bench Trial (Dec. 1, 2014) Tr. at 73:22-25.

Kavanaugh testified that it was not easy or convenient to repair a mixing fin; the truck would be laid up for a week or more during the repair process. Defs.' Ex. M2 (Kavanaugh Dep.

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<sup>15</sup> Vona testified that state certification is not necessary for concrete plants and only about 50% are certified. Defs.' Ex. A4 (Underlying Trial [Feb. 9, 2011] Tr. at 29:15-23). State certification is only necessary if a plant wants to obtain a contract with the government. *Id.* Paramount had its trucks and plant certified by the state of Connecticut in 2008. Pl.'s Ex. 64 (Riviere Dep. 162:23-164:2, 191:11-20).

81:15-82:1). Nevertheless, it was important to keep the mixing fins in working order and Kavanaugh asked Riviere to have mechanics repair the fins whenever they were broken. Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 61:18-24). According to Kavanaugh, Riviere regularly refused those requests. *See id.* In hindsight, however, Kavanaugh recognized that Paramount's finances were tight and Riviere had to take a macro view. Defs.' Ex. M2 (Kavanaugh Dep. 82:19-83:22). As the batchman, he wanted everything in peak condition and it was frustrating to use equipment that was not at 100%, but Kavanaugh realized that was not realistic in the concrete-manufacturing industry. *Id.* Kavanaugh was not sure whether Riviere denied repair requests that he feasibly could have authorized, given Paramount's financial circumstances. *See id.*

Riviere testified that Kavanaugh would not have needed permission to fix a mixing fin; they were kept in stock and welded in on a regular basis, without prior authorization. Defs.' Ex. A3 (Riviere Dep. 234:24-27). Riviere also denied refusing any request to repair a truck and testified that any fin that was more than 50% worn down would have been repaired. Pl.'s Ex. 64 (Riviere Dep. 164:3-13, 234:15-22). Riviere emphasized that none of Paramount's seven trucks ever failed inspection, and all four trucks that Paramount sought state certification for received it. Defs.' Ex. A3 (Riviere Dep. 195:26-196:11, 199:10-200:3).

Fourth, hardened concrete in the mixing truck occasionally would dislodge and clog the pump, pipes, and/or hoses during the shooting process. Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 50:9-14); Pl.'s Ex. 64 (Riviere Dep. 16-24, 216:5-7). Kavanaugh testified that they regularly inspected the concrete drums and did their best to control the buildup of hardened concrete. Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 49:13-25, 50:17-51:8); Defs.' Ex. M2 (Kavanaugh Dep. 94:4-95:12). He tried to implement a procedure whereby the drums were

cleaned thoroughly at the end of each day and weighed to determine if excess concrete was in the truck. Kavanaugh eventually abandoned this plan, though; washing out the trucks out was a messy process and they had a hard time finding an acceptable place to do it without causing flooding and receiving complaints from neighbors. Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 51:10-52:12, 63:16-64:4).

Fifth, Paramount's trucks did not have rotation counters and Paramount lacked a set procedure for counting rotations during the mixing process.<sup>16</sup> See Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 59:5-8, 60:4-27, 63:5-8); Pl.'s Ex. 64 (Riviere Dep. 237:20-239:15). Concrete starts to stiffen shortly after it is mixed and, according to industry standards, it generally remains "fresh" for only ninety minutes or 300 rotations in the mixing truck. Bench Trial (Dec. 1, 2014) Tr. at 106:7-9. Without a means of counting rotations, there was a greater chance that Paramount's concrete could become "stale" before reaching the job site. See *id.* at 107:3-11.

Kavanaugh testified that he and Riviere sometimes disagreed about whether a job site was too far from Paramount's plant to deliver a fresh, quality product. In Kavanaugh's estimation, Riviere was overly concerned with keeping customers and had a hard time saying no to repeat or other "good" customers. Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 43:1-45:8). Kavanaugh was concerned that Paramount delivered inferior quality shotcrete on occasion, primarily due to the length of time that the concrete was in the truck between batching and arrival.<sup>17</sup> Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 86:8-13); Defs.' Ex. M2 (Kavanaugh Dep. 108:4-9). Riviere, however, testified at his deposition that he knew about the

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<sup>16</sup> Paramount had rotation counters put on its trucks during the process of having the plant state certified. Pl.'s Ex. 64 (Riviere Dep. 162:23-164:2, 191:11-20).

<sup>17</sup> Kavanaugh specifically remembered telling Riviere that the site of one of the pools at issue in this case, 20 April Drive in Easton, Connecticut, was too far from the plant and that it would be irresponsible to keep concrete in truck that long. See Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 86:8-13); Defs.' Ex. M2 (Kavanaugh Dep. 108:4-9).

time and distance limits, and believed that anything over forty-five minutes from batching to arrival at the job site generally was too long. Pl.'s Ex. 64 (Riviere Dep. 135:3-16).

Finally, Kavanaugh testified that mason sand, which is cheaper than concrete sand, was utilized at Paramount's plant during his time as a batchman. Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 55:24-56:4); Pl.'s Ex. 64 (Kavanaugh Dep. 67:7-23, 74:11-14, 78:12-16). Mason sand typically is not used in concrete, because it has far greater amounts of fine materials like silt and clay than washed concrete sand. Bench Trial (Dec. 1, 2014) Tr. at 25:12-17, 34:11-24.

Unlike concrete sand, whose particles are generally quasi-spherical or rounded, the particles in mason sand are smaller and can be angular. *Id.* at 35:4-35:6. Thus, mason sand particles have a greater surface area, requiring more water/cement paste to coat them. *Id.* at 35:8-23. Concrete made with any significant amount of mason sand would require a great deal more water to achieve workable concrete with the same slump than concrete made with concrete sand. *Id.* at 35:24-36:5. But, adding water to achieve the desired slump would reduce the strength of the hardened concrete (unless a proportional amount of cement was added) and increase the propensity for shrinkage and cracking. *Id.* at 32:22-33:3, 36:1-5, 76:7-17, 93:21-24. Although it is possible to make concrete using mason sand, it would be costly and would require significant modification of the mix design to do so.<sup>18</sup> *Id.* at 36:4-13, 185:12-20, 199:21-200:13; Defs.' Ex. M2 (Kavanaugh Dep. 71:7-10).

Kavanaugh estimated that approximately one out of every twenty sand deliveries to Paramount Concrete was mason sand. He testified that the mason sand was stored in the same bin as the concrete sand, making it impossible to tell how much of each type of sand was going

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<sup>18</sup> The basic ingredients in Paramount's shotcrete mixes were Type I or II Portland cement, 3/8 inch gravel, concrete sand, water and air entrainment. Paramount's shotcrete also often contained chemical additives, which varied from mix to mix. Pl.'s Ex. 7 at 2; Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 28:21-29:2) Kavanaugh did not recall any of Paramount's shotcrete mixes specifically calling for mason sand and Harleysville's expert, Geoffrey Hichborn testified that he reviewed twenty-two of Paramount's fifty mix designs and none called for any amount of mason sand. Bench Trial (Dec. 1, 2014) Tr. at 43:15-25.

into the concrete mixture.<sup>19</sup> Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 53:19-54:6).

Kavanaugh was concerned about this and complained to Riviere, who told him that it was not a problem. *Id.* at 54:13-27, 55:13-27, 56:6-15.

At his deposition, Riviere vehemently disputed Kavanaugh's assertions. He testified that he never purposely ordered mason sand to save money and asserted that it was highly unlikely that anyone at Paramount Concrete did so.<sup>20</sup> Defs.' Ex. A3 (Riviere Dep. 239:23-240:5, 246:11-15). Mason sand was used at Paramount Stone, but Paramount Concrete never used sand from Paramount Stone in its concrete. Pl.'s Ex. 64 (Riviere Dep. 137:26-138:18). Paramount Stone and Paramount Concrete were two separate companies and they purchased sand separately. *Id.* at 161:12-162:2; *see also* Bench Trial (Dec. 2, 2014) Tr. at 218:18-22. Mason sand looks and feels different than concrete sand, so it would have been obvious to Riviere if it had been delivered. *See id.* at 244:19-245:1. Although Riviere was not there to oversee every delivery, everyone knew that mason sand and concrete sand were not interchangeable, and that mason sand was not to be used at the concrete plant. *Id.*

In the course of preparing for the underlying trial, Richard Vona reviewed approximately 1,500 sand-delivery tickets, which spanned the relevant time period. He found nine tickets for deliveries of mason sand.<sup>21</sup> Bench Trial (Dec. 2, 2014) Tr. at 238:3-6, 269:16-17. Paramount's records indicate that it paid for concrete sand on those occasions, regardless of what was actually delivered. *See* Defs.' Exs. B6, B10, B13.

At the underlying trial, the president of the company that delivered sand and gravel to Paramount Stone and Paramount Concrete, Guy Odierno, testified that the company that he

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<sup>19</sup> Aggregates should be stored separately, to prevent intermixing. Pl.'s Ex. 40A at 60.

<sup>20</sup> Riviere testified that he did not know that mason sand was cheaper than concrete sand at the relevant time. Pl.'s Ex. 64 (Riviere Dep. 245:2-20).

<sup>21</sup> If those deliveries were, in fact, mason sand, that would mean that between 1-in-166 and 1-in-167 deliveries were mason sand.

purchased aggregate from sometimes produced incorrect invoices for loads of sand that were delivered to Paramount Concrete. He recalled, for example, that his company had delivered concrete sand on July 27, 2006, even though the delivery ticket said “mason sand.” *See* Defs.’ Ex. A7 (Underlying Trial [Feb. 15, 2011] Tr. at 30:9-31:14; Pl.’s Ex. 15). Odierno attributed the error to the fact that the aggregate supplier, Amboy Aggregates, was a longtime supplier of mason sand to Paramount Stone. Odierno testified that his company would try to fix any errors on its end, because mason sand was cheaper than concrete sand and he did not want his customers to think he was trying to cheat them. Importantly, Odierno testified that the error was limited to the labeling of the invoices and did not extend to the content of the product supplied. *Id.* at 7:23-9:4, 18:5-8, 30:6-8.

#### D. Failure of the Pools

Paramount’s shotcrete was shipped to R.I. Pools and six other companies, and used at 135 locations, 122 of which were pools. Pl.’s Ex. 7 at 3. R.I. Pools shot over sixty pools with Paramount’s shotcrete. Bench Trial (Dec. 2, 2014) Tr. at 180:12-20. The success of R.I. Pools was important to Paramount; R.I. Pools was Paramount’s biggest customer and the owners of R.I. pools were close relatives of the Vonas. *Id.* at 235:20-236:1.

Of the sixty pools R.I. pools shot with Paramount’s shotcrete, nineteen cracked. *See id.*; Pl.’s Ex. 64 (Underlying Trial [Feb. 15, 2011] Tr. at 75:13-23, 76:17-77:5); *see also* Pl.’s Ex. 52. Two additional pools shot with Paramount’s shotcrete cracked as well. Bench Trial (Dec. 1, 2014) Tr. at 188:7-25. Other than those twenty-one pools, Paramount received no major complaints related to its shotcrete. Pl.’s Ex. 7 at 3.

Richard Vona testified at the bench trial that he never intended to cause any harm and had no idea that Paramount might have supplied a defective product to R.I. Pools until his cousin

contacted him about the cracking in April 2009. Bench Trial (Dec. 2, 2014) Tr. at 255:1-6, 255:14-256:1. The failure of the pools did not just provoke the underlying litigation; it tore apart the fabric of his family. *Id.* at 257:12-258:5.

At his deposition, Kavanaugh testified that despite his previously expressed concerns, he too was surprised to learn that the pools had cracked. Defs.' Ex. M2 (Kavanaugh Dep. 101:8-18). Although he and Riviere often butted heads over how to run the business, Kavanaugh did not think that their disagreements ever resulted in production of concrete that was not reasonably safe. *Id.* at 106:10-17. Kavanaugh testified that he never sent out anything thinking "this batch is ultimately doomed," and never would have sent out a product that he knew or believed to be deficient. *Id.* at 104:17-21, 106:25-107:3, 107:16-18.

#### E. Investigations into the Failure of the Pools

In advance of the underlying litigation, R.I. Pools, Paramount, and their respective insurers undertook to discover the cause of the cracking. R.I. Pools hired Gerard Feldman, a structural engineer who served as R.I. Pools' expert at the underlying trial, to examine the pools and advise on repairs. Feldman produced a report on nine of the pools. *See* Pl.'s Exs. 18, 22.

Feldman commissioned American Petrographic Services ("APS") to petrographically examine four shotcrete core samples taken from two of the pools. APS produced findings, dated May 2, 2008, which were included within Feldman's larger report. The APS findings criticize the shotcrete's capacity to resist freeze-thaw deterioration. *Id.* Other than that, the "overall quality of shotcrete appeared to be good" in the samples analyzed. Pl.'s Ex. 22; Defs.' Ex. A6 (Underlying Trial [Feb. 14, 2011] Tr. at 30:16-31:18, 58:24-59:9). There were no issues with the water/cement ratio. The paste hardness was described as "medium to soft" and the paste/aggregate bond was judged to be "fair to good," though some sand and soft paste-rich areas

were observed. *Id.* The aggregate particles were mostly sub-rounded (though there were many sub-angular particles) and the coarse and fine aggregates had a “good overall uniform distribution.” *Id.* The mixture was relatively consistent, no sand pockets were observed, and there was no issue with alkaline silica or alkaline carbonate reactivity. *Id.* The APS findings therefore conclude that cause of the cracking is unclear. At least some of the problem appeared to be with the application of the shotcrete. *Id.*

Feldman himself analyzed seventeen shotcrete core samples from five pools, nine of which were tested for compressive strength. The core samples Feldman took ranged from 1,410 to 6,870 psi, with an average compressive strength of 4,004 psi and a standard deviation of 1,891. In Feldman’s opinion, “the large deviation in the test results for the same mix design indicate[d] poor quality control resulting in variation between different deliveries of shotcrete.” Pl.’s Ex. 18 at 2. Feldman also noted that the pools with the most extensive cracking contained relatively soft, voided shotcrete at the site of the cracks, which indicated that the shotcrete was not well mixed. *Id.* at 1. However, he detected no unusual materials in the shotcrete and it did not appear that excess water was added at the site. *Id.* at 2.

Feldman’s report ultimately concludes that the cracks in the pools were “the result of shrinkage of localized low-strength areas of shotcrete” caused by poorly mixed, non-uniform concrete. Pl.’s Ex. 18 at 1-2. Feldman affirmed those conclusions at the underlying trial. Pl.’s Ex. 64 (Underlying Trial [Feb. 14, 2011] Tr. at 23:15-24:1, 25:19-26:15).

A separate report was prepared by Connecticut Testing Laboratories (“CTL”). The report, dated November 22, 2009, is titled “Laboratory Testing of Shotcrete Cores from Steinharter and Peake Residential Pools, Weston, Connecticut.” Pl.’s Ex. 66. CTL analyzed eleven shotcrete cores from those two pools, both of which were over three years old at the time

the cores were examined. *Id.* Its report includes both compressive strength testing and petrographic examination of two of the eleven cores. *Id.*

Of the two cores petrographically examined, one was extensively cracked and the other was in good condition. The composition of the two cores was similar, consisting of “crushed siliceous rock, coarse aggregate and siliceous sand dispersed in a hardened Portland cement paste,” which appeared to be “in an advanced state of hydration.” *Id.* The sand particles varied in shape from “subrounded to angular,” and mica flakes were common. *Id.* The CTL report concludes that the shotcrete did not appear to contain “an excess of crushed material or excessive fines.” *Id.* The core that was cracked exhibited “non-uniformity in the distribution of constituents and variability in the water-cement ratio throughout the depth of the core” and its surface was “characterized by weakly bound, discrete, paste-coated aggregates,” “typical of rebound in shotcrete applications.” *Id.*

At the underlying trial, Paramount’s expert, Timothy Walker, testified that in his opinion, three things caused the pools to crack: (1) the strength of the shotcrete; (2) improper placement of the rebar and not enough steel in the pool shell to hold the shotcrete together; and, most importantly (3) the knowledge and skill of those doing the shotcrete work. Defs.’ Ex. A7 (Underlying Trial [Feb. 15, 2011] Tr. at 130:3-13,150:3-151:3). There were major variations in the shotcrete as placed, but Walker could not say with “tremendous certainty” whether that was due to poor shotcrete coming out of the truck or poor application of the shotcrete. *Id.* at 129:10-25. In his opinion, to a reasonable degree of engineering certainty, the type of voiding in the shotcrete core sample he examined (via photograph at trial) was due to application of the shotcrete and not the shotcrete itself. *Id.* at 108:12-109:1. Walker testified, however, that bad

shotcrete was a “contributing force” to the pools’ failure. Pl.’s Ex. 64 (Underlying Trial [Feb. 16, 2011] Tr. at 30:11-22).

#### F. Hichborn’s Assessment

At the December 2014 bench trial, Harleysville relied heavily on the testimony of an expert witness, Geoffrey Hichborn, to make its case for expected or intended injury. Hichborn testified that, in his opinion, Paramount had a well-designed concrete plant capable of producing uniform, quality concrete. Bench Trial (Dec. 1, 2014) Tr. at 38:1-2. Paramount’s plant had the necessary equipment and its employees had adequate knowledge. *Id.* at 46:10-13. The company’s problems arose because it did not pay enough attention to quality control. *Id.* at 107:15-21. Paramount’s practices in manufacturing and delivering shotcrete deviated from industry standards with respect to: (1) the use of mason sand in its shotcrete; (2) the poor maintenance of its trucks, particularly the mixing fins; (3) the irregular and sometimes spontaneous additions of chemical admixtures; and (4) an inability to control the input of water into its shotcrete mixtures, due to the malfunctioning water meter. *Id.* at 97:9-14, 126:24-127:22.

Hichborn focused most heavily on the issue of mason sand. Relying on Kavanaugh’s deposition and underlying trial testimony, as well as the tickets indicating delivery of mason sand, Hichborn concluded that there was “an abundant amount of evidence that masonry sand was actually put in to the pools.” *Id.* at 85:2-5. Hichborn did not examine the delivery tickets himself or match them with the invoices and he was not familiar with Odierno’s testimony that Amboy Aggregates sometimes mislabeled concrete sand as mason sand. *Id.* at 155:18-23.

The petrographic reports, in Hichborn’s estimation, confirmed the presence of mason sand in Paramount’s concrete, because the reports showed inhomogeneous concrete with

“tremendous variation” in its composition and a varying water/cement ratio.<sup>22</sup> *Id.* at 84:18-85:1. Hichborn testified that the presence of mason sand would have been “most disruptive,” because mason sand was not part of the mix design and mason sand requires significantly more water to make workable concrete, which would have diminished strength and made the concrete more prone to cracking. *Id.* at 83:5-16, 85:2-91:25, 124:9-18. Hichborn thought it likely that too much water was in fact used, because of the mason sand, the faulty water valve, and the lack of a moisture meter. *Id.* at 125:3-8, 127:16-22. Hichborn did not attempt to reconcile that opinion with Feldman’s conclusions, the ATS findings, or the CTL report.

Hichborn concluded that, to a high degree of engineering probability, Paramount’s manufacturing and quality-control problems, particularly the inclusion of mason sand, led Paramount to produce non-uniform shotcrete. The lack of uniformity led to shrinkage of the pool shells and the shrinkage, in turn, caused the pools to crack. *Id.* at 102:2-5. Hichborn testified that Paramount must have known that its practices would result low strength shotcrete that would cause such cracking. *Id.* at 81:25-82:1, 128:8-129:17.

Hichborn, however, did not inspect any of the nineteen pools himself. He never visited Paramount’s concrete plant, never inspected the mixing trucks, and never examined Paramount’s shotcrete. His knowledge of the plant’s structure was limited to descriptions from the underlying trial, along with Zillow and Google aerial view images of the plant. Pl.’s Ex. 53. Hichborn did not review Paramount’s driver time sheets or logs, so he did not know how long the shotcrete was in the truck for any of the nineteen pools. Hichborn did not even review all the materials made available to him; he reviewed “the bulk of it,” but not everything. Moreover, Hichborn

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<sup>22</sup> Hichborn was open to the possibility that asphalt sand was included as well. Although there were tickets indicating asphalt sand had been delivered, Kavanaugh testified that to the best of his knowledge, asphalt sand was never delivered to Paramount Concrete. Defs.’ Ex. M2 (Kavanaugh Dep. 78:17-22). Odierno testified that any ticket for asphalt sand would have been “absolutely wrong,” because his company was not buying asphalt sand for any reason during the relevant time period. Defs.’ Ex. A7 (Underlying Trial [Feb. 15, 2011] Tr. at 10:1-14).

never met Riviere or Kavanaugh and did not view the video of Kavanaugh's deposition. He did not interview the pool owners or review the pool plans. He thought that Feldman and Walker's investigations were incomplete, but he never met with them or attempted to supplement their work. Bench Trial (Dec. 1, 2014) Tr. at 134:22-23, 139:1-140:20, 141:3-142:23, 150:5-152:9, 153:25-154:6.

Importantly, Hichborn was of the opinion that Kavanaugh probably tried to do his best and never intended to deliver anything other than what was promised. *Id.* at 154:15-24. He agreed with counsel for R.I. Pools that Kavanaugh "never expected [any batch of Paramount's shotcrete] to doom, harm, [or] damage any swimming pool into which it went into." Bench Trial (Dec. 2, 2014) Tr. at 184:13-18.

### **III. Conclusions of Law**

Paramount's CGL policy excludes from coverage "bodily injury" or "property damage" that is "expected or intended from the standpoint of the insured." CGL Policy, section I.2(a). Harleysville does not contend that Paramount intended for the pools to crack. The issue is whether Paramount's acts demonstrate that it expected its shotcrete to cause harm.

Under Connecticut law, the applicability of the expected or intended injury exclusion turns on the subjective expectations of the insured, not what an objectively "reasonable person" would have foreseen. *Walukiewicz*, 290 Conn. at 597; *see also Steadfast Ins. Co. v. Purdue Federick Co.*, No. X08CV020191697S, 2006 WL 1149185, at \*3-4 (Conn. Super. Ct. Apr. 11, 2006) (applying "majority rule" that unless the policy indicates otherwise, a court "should apply a subjective standard as to whether the insured expected or intended the damage"). No Connecticut appellate decision, however, examines whether and to what extent the probability of harm bears on the application of the exclusion.

The Second Circuit, applying analogous New York law, has applied the expected or intended injury exclusion narrowly, equating the term “expected” with constructive intent. Expected injury occurs where the insured, although not acting with the purpose of causing injury, “knew that the damages would flow directly and immediately from its intentional act.” *City of Johnstown v. Bankers Standard Ins. Co.*, 877 F.2d 1146, 1150 (2d Cir. 1989); *see also Cont’l Cas. Co. v. Rapid-Am. Corp.*, 80 N.Y.2d 640, 649 (1993). In *Johnstown*, that meant the insurer could not escape its duty to defend by establishing that the insured “was warned that damages might ensue from its actions,” or even that, “once warned, [the] insured decided to take a calculated risk and proceed as before.” 877 F.2d at 1150. Because the insurer failed to establish that the insured “knew that the damages would flow directly and immediately from its intentional act,” it was obligated to defend the insured against claims brought by the injured parties. *Id.* The Second Circuit justified this limitation, noting: “[i]t is apparent that to do otherwise, and to exclude all losses or damages which might in some way have been expected by the insured, could expand the field of exclusion until virtually no recovery could be had on insurance.” *Id.*

Two Connecticut Superior Court decisions, by contrast, indicate that an insured expects or intends injury when it “knows or should know that there was a substantial probability of damage from its acts or omissions.” *Linemaster Switch Corp. v. Aetna Life & Cas. Corp.*, No. CV91-0396432S, 1995 WL 462270, at \* 25 (Conn. Super. Ct. July 25, 1995) (citing *City of Carter Lake v. Aetna Casualty & Surety Co.*, 604 F.2d 1052, 1058-59 (8th Cir. 1979)); *Steadfast*, 2006 WL 1149185, at \*3-4 (citing *Linemaster*). That formulation of expected injury parallels the standard for recklessness: an actor acts recklessly when he “realizes or . . . should realize that there is a strong probability that harm may result, even though he hopes or even expects that his conduct will prove harmless.” *Mingachos v. CBS, Inc.*, 196 Conn. 91, 103 (1985) (citing

Restatement (Second) of Torts § 500 cmt f (1965)). It does not, however, comport with *Walukiewicz*, which adopts a purely subjective standard.<sup>23</sup> 290 Conn. at 597-98 n.18 (“We reject the plaintiff’s argument that the objective rule of intent used in tort and criminal law, on which the trial court relied, should control the interpretation of an [expected or intended injury] exclusion in an insurance contract.”).

Whether or not Connecticut appellate courts would equate expected injury with a “substantial probability” of harm, it is clear that *Paramount* must have known about that substantial probability in order for the exclusion to apply.<sup>24</sup> It is not enough that the harm was foreseeable to a reasonable concrete manufacturer in Paramount’s position. *Walukiewicz*, 290 Conn. at 597-98; *see also Capstone Bldg.*, 308 Conn. at 775 (noting, in interpreting the term “accident” in CGL policy, that “[i]nsurance policies . . . are designed to cover foreseeable risk”). Nor is it sufficient that a jury found that Paramount acted with reckless disregard for the safety of others. *See id.*; *Royal Indem. Co. v. Soneco/Ne., Inc.*, 183 F. Supp. 2d 526, 533-34 (D. Conn. 2002) (recognizing “expected or intended” injury exclusion does not necessarily bar coverage for alleged reckless misconduct having substantial certainty to cause injury).

Harleysville failed to prove that any of the Vonas were aware of the quality control issues at Paramount Concrete. Carlo and Grace Vona’s involvement was limited to serving as financial backers of the company and Richard Vona took a back seat once the plant was up and running. It is frankly inconceivable that the Vonas would have expected or intended Paramount’s product

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<sup>23</sup> Other courts have rightly recognized that *City of Carter Lake* in fact applies an objective standard. *E.g.*, *Honeycomb Sys., Inc. v. Admiral Ins. Co.*, 567 F. Supp. 1400, 1404 (D. Me. 1983); *Gen. Housewares Corp. v. Nat’l Sur. Corp.*, 741 N.E.2d 408, 413 (Ind. Ct. App. 2000).

<sup>24</sup> Both *Linemaster* and *Steadfast* appear to cite *Johnstown* with approval and both purport to apply a subjective standard for expected or intended injury. *See Linemaster*, 1995 WL 462270, at \* 25; *Steadfast*, 2006 WL 1149185, at \* 3-4. *Steadfast* may actually apply a subjective standard; it cites *Linemaster*’s “substantial probability” language without including “knows or should know.” 2006 WL 1149185, at \* 4. Yet, *Steadfast* also cites *County of Broome v. Aetna Cas. & Sur. Co.*, 540 N.Y.S.2d 620 (3d Dep’t. 1989), which, like *Linemaster*, includes the language “should have known.” Although *County of Broome* is a New York case, it applies New York law incorrectly. *Johnstown*, 877 F.2d at 1151 n.1.

to harm the pools, but sold the product nonetheless. R.I. Pools was their largest customer and the owners of R.I. Pools were family. By all accounts, the failure of the pools and the years of litigation this disaster produced caused irreparable damage to both the business and family relationships.

Harleysville likewise failed to demonstrate that Riviere expected or intended injury, because Riviere's testimony indicates that he perceived no major problems with Paramount's shotcrete whatsoever. Pl.'s Ex. 64 (Riviere Dep. 104:6-12). Riviere was not trained to make concrete, but he aware of the basics. Riviere was cognizant, for example, of the fact that concrete cannot be mixed in the truck for too long and that temperature impacts the length of time concrete will stay fresh. Pl.'s Ex. 64 (Riviere Dep. 135:3-16). He testified that he factored distance to the job site in his decision whether to take work and tried to limit the time between batching and arrival to forty-five minutes. *Id.* Riviere also knew that mason sand did not belong in concrete. He testified that he never purchased mason sand for Paramount Concrete, never intended for it to be used in Paramount's shotcrete, and did not believe that it ever was used in the production of shotcrete. Defs.' Ex. A3 (Riviere Dep. 239:23-240:5, 246:11-15); Pl.'s Ex. 64 (Riviere Dep. 137:26-138:18, 161:12-162:2, 244:19-245:1).

Although he regularly attempted to cut costs, because Paramount was not a profitable company, Riviere testified that he tried to keep everything in working order and emphasized that Paramount faced no major hurdles in obtaining state certification in 2008. Defs.' Ex. A3 (Riviere Dep. 195:26-196:11, 199:10-200:3, 234:24-27); Pl.'s Ex. 64 (Riviere Dep. 164:3-13, 234:15-22). He acknowledged there were occasional issues at the job site – e.g., old concrete clogging the mixer – but viewed those as “random problem[s] on the job,” not fundamental flaws in the product itself. Defs.' Ex. A3 (Riviere Dep. 215:20-26).

Kavanaugh, of course, disagreed with many of Riviere's assertions and identified several problems that arose in the course of manufacturing Paramount's shotcrete.<sup>25</sup> Kavanaugh discussed the malfunctioning water meter, the broken fins and hardened concrete in the trucks, the excessive distance to several job sites, and the intermittent use of mason sand. Defs.' Ex. A4 (Underlying Trial [Feb. 9, 2011] Tr. at 33:2-9); Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 23:27-24:17, 38:1-39:24, 43:1-45:8, 49:13-25, 50:9-14, 50:17-51:18, 55:13-56:15, 61:18-27, 67:11-15, 84:9-27, 86:8-13); Pl.'s Ex. 64 (Kavanaugh Dep. 67:7-23, 74:11-14, 78:12-16); Defs.' Ex. M2 (Kavanaugh Dep. 61:22-63:13). Yet, Kavanaugh also testified that he thought he compensated for many of those issues and he never sent out a batch of shotcrete that he believed was not reasonably safe, much less one he thought was "doomed." Defs.' Ex. M2 (Kavanaugh Dep. 63:24-65:14, 72:11-73:1, 74:3-7, 104:17-21, 106:10-17, 106:25-107:3, 107:16-18); Pl.'s Ex. 64 (Underlying Trial [Feb. 7, 2011] Tr. at 40:18-25, 64:12-65:6). Although he had concerns about the quality of Paramount's shotcrete at times, Kavanaugh ultimately was surprised that the shotcrete caused major cracking. Defs.' Ex. M2 (Kavanaugh Dep. 101:8-18).

At the December 2014 bench trial, Harleysville did not undermine any of that testimony. Instead, Harleysville, through Hichborn, tried to prove that mason sand was the cause of the cracking and that Paramount had to have known that using mason sand would produce defective shotcrete. Although that is a plausible theory, the evidence regarding the use of mason sand was inconclusive. On the one hand, Kavanaugh testified that mason sand was occasionally delivered and stored in the same bin as concrete sand, and nine tickets showed deliveries of mason sand during the relevant period. On the other hand, Riviere testified that mason sand was never used, Paramount apparently paid for concrete sand even when the delivery tickets said mason sand,

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<sup>25</sup> Riviere terminated Kavanaugh's employment with Paramount Concrete, which may or may not have contributed to Kavanaugh's attempts to discredit Riviere. Without the benefit of seeing either Kavanaugh or Riviere testify, it is difficult to judge the credibility of either.

and Odierno testified that he did not deliver mason sand to Paramount Concrete and explained the likely source of the error. Moreover, Hichborn did not conduct any tests on Paramount's shotcrete himself and none of the tests that were conducted flagged mason sand as a potential cause of the cracking.

Even assuming that mason sand was occasionally used, the presence of mason sand does not prove that anyone at Paramount knew that the shotcrete would likely or certainly cause harm. Hichborn himself admitted that it is theoretically possible to make concrete using mason sand. Bench Trial (Dec. 1, 2014) Tr. at 36:4-13; Bench Trial (Dec. 2, 2014) Tr. at 185:12-20, 199:21-200:13. Kavanaugh, the only Paramount employee who testified that mason sand was used, could have believed he was producing decent shotcrete even though mason sand was mixed in with the concrete sand. In fact, Kavanaugh's testimony indicates that he *did* believe Paramount's shotcrete was reasonably safe despite the presence of mason sand. Kavanaugh was quick to find fault with his ex-employer, but at the end of the day he was surprised that Paramount's product caused so much damage to the pools.

Harleysville established what R.I. pools already proved at the underlying trial: Paramount lacked an effective quality control system, its management lacked experience with concrete, and its batchman did not feel adequately trained. Those issues point to severe deficiencies in Paramount's operations, and were enough for the jury to find that it acted "recklessly." But they do not prove that the relevant individuals at Paramount actually knew, much less intended, that the shotcrete was so defective it could cause harm. The record does not establish that anyone at Paramount comprehended that those issues were so significant that the product was substantially likely to cause damage to the pools. Without that knowledge, Paramount cannot be held to have

“expected” the nineteen pools to crack. *See Walukiewicz*, 290 Conn. at 597-98. Harleysville has therefore failed to meet its burden of establishing expected or intended injury.

#### **IV. Conclusion**

For the foregoing reasons, the motion for judgment on partial findings (doc. # 195) is granted, because the expected or intended injury exclusion injury does not bar coverage. Harleysville is therefore obligated to indemnify Paramount for the damages caused by its shotcrete.

It is so ordered.

Dated at Bridgeport, Connecticut, this 7th day of August 2015.

/s/ STEFAN R. UNDERHILL  
Stefan R. Underhill  
United States District Judge