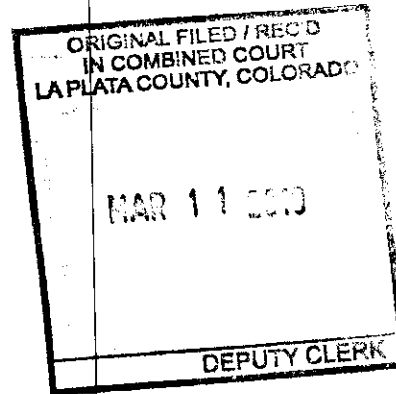|	
DISTRICT COURT, LA PLATA COUNTY, COLORADO Court Address: 1060 East 2nd Avenue, Room 106, Durango, CO, 81301-5157	
The People of the State of Colorado, Plaintiff, v. **MARK ALLEN REDWINE,** Defendant.	
Douglas K. Wilson, Colorado State Public Defender John Moran, Attorney No. 36019 Justin Bogan, Attorney No. 33827 Deputy Public Defender 175 Mercado Street, Suite 250, Durango, CO 81301 Phone: (970) 247-9284 Fax: (970) 259-6497 E-Mail: Justin.Bogan@coloradodefenders.us Email: John.Moran@coloradodefenders.us	Case Number: 17CR343 Division: 1
PUBLIC ACCESS **BRIEF SUPPLEMENTING MOTIONS TO EXCLUDE UNRELIABLE CADAVER DOG SNIFF EVIDENCE** **[D109]**	

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I. PRELIMINARY STATEMENT

On July 20, 2017, five years after his thirteen-year-old son, Dylan Redwine, went missing, Mark Redwine was indicted by a grand jury in La Plata County, Colorado, for second degree murder and child abuse. Mr. Redwine currently awaits trial.

Because there was little evidence concerning Dylan's whereabouts subsequent to his disappearance, local authorities deployed several so-called "cadaver dogs" in an attempt to detect Dylan's remains. "Cadaver dogs" are said to be able to follow and locate the scent of decomposing human remains—or, as alleged here, the location where human remains were once present—and then to "alert," or signal, to their handler when the dog believes it has detected such an odor. Then, despite the lack of empirically validated standards for them to do so, the handler makes a subjective interpretation of the dog's purported alerts, and in this way, the historical presence of human remains is ostensibly proved.

The ability of dogs to detect some scents that are imperceptible to human beings is not at issue in this case. What is at issue is what has never has been proven with any degree of scientific reliability: the ability of a dog to detect the residual scent of a particular object, including human remains, at a specific location days, weeks, months, or even more than a year *after* that object has been removed. Yet, that is precisely the speculative theory upon which the State seeks to base its case against Mr. Redwine. Here, the State of Colorado argues, without evidence, that because the handlers believe that their dogs "alerted" to the presence of human remains—ten days to *more than a year* after Dylan disappeared—that those "alerts" are admissible as evidence that, in fact, Dylan's deceased human body was once at those locations— despite the fact that *no* remains were found in any of the locations where the dogs allegedly alerted to residual cadaver scent. Assuming, for the moment, that some dogs theoretically are capable of such incredible olfactory feats (they are not), nothing in the record reveals with any

degree of reliability that the dogs utilized *in this case* were capable of doing so. And, even if it could be reliably demonstrated that the cadaver dogs in this case were capable of distinguishing among the smells of objects no longer present, the highly biasing circumstances under which these alerts were made, and the lack of relevant handler qualifications, renders the handlers' interpretations of those alerts even further suspect.

The proper admission of this evidence would require proof that these dogs are capable of reliably distinguishing between residual scent from blood or other detritus from living human bodies and that from human cadavers, as well as between human and animal scent (whether living or deceased), and, critically, of reliably making these distinctions days, weeks, months, or even more than a year *after* an alleged human body had been at a location. It further requires evidence that handlers are capable of interpreting cadaver dog "alerts" with a high degree of reliability (and without biasing such results through cuing or misidentification), such that a jury will have some basis to gauge the weight that ought to be given to such testimony. In other words, evidence would be required that the dogs, in this case, could actually do—and did actually do—the things the State has claimed they have done here. None of this proof has been established.

Notably, Colorado courts have never considered the admission of cadaver dog evidence. The only Colorado case that has extensively addressed canine-indicated scent evidence, generally, *Brooks v. People*, 975 P.2d 1105 (Colo. 1999), was decided nearly twenty years ago and did not involve the type of canine evidence implicated here. Moreover, since *Brooks*, recent scientific research has seriously undermined the reliability of canine-indicated scent evidence, including cadaver dog evidence, which, consequently, impacts its admissibility in criminal trials.

The State's reliance on cadaver dog evidence has profound implications not only for Mr. Redwine's case, but also for any future cases before this Court involving such evidence.

II. STATEMENT OF FACTS

On or between November 18 and 19, 2012, in La Plata County, Colorado, Dylan Redwine went missing. La Plata County, Colorado Grand Jury Indictment, July 20, 2017 ("Indictment"). He was purportedly last seen alive on November 18, 2012, when he arrived by airplane to visit his father, Mark Redwine (hereinafter "Mr. Redwine"). *Id.* Several hours after arriving in Colorado, Dylan and his father returned to Mr. Redwine's house, located at 2343 County Road 500, Bayfield, La Plata County, Colorado. *Id.* Dylan Redwine's last electronic communication with anyone was at 9:37 p.m. on November 18, 2012; he was not seen or heard from again after that evening. *Id.*

Traces of blood subsequently were found around Mr. Redwine's living room, including on the couch, the floor in front of the couch, the corner of a coffee table, on the floor beneath a rug, and on a love seat. *Id.* Subsequent DNA testing only confirmed that Dylan was the source of the traces of blood found on the love seat. *Id.*

In June 2013, some of Dylan's remains were discovered on Middle Mountain Road, approximately eight miles from Mr. Redwine's house y road. *Id.* On November 1, 2015, hikers further up the mountain on Middle Mountain Road found Dylan's skull. *Id.*

Throughout the investigation, a total of sixteen "cadaver dogs" were deployed in an attempt to detect the presence of Dylan Redwine's cadaver, i.e. the scent of his bodily remains. *See generally* Cadaver Dog Discovery, D0342017CR000343 ("Discovery"). The cadaver dogs and their handlers included the following teams: Carren Corcoran (handler) and Molly (dog); Wendy Kessinger (handler) and Sadie and Jetta (dogs); Rae Dreves, née Randolph (handler) and Oso and Selah (dogs); Katie Steelman (handler) and Darc (dog); Roy Vreeland (handler) and

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Cayenne and Hannah (dogs); Lette Birn (handler) and Piper (dog); Linda Meincke (handler) and Banner (dog); Cindy Oliver (handler) and Callie (dog); Mary Berry (handler) and Taz (dog); Heidi Miller (handler) and Pippa (dog); Art Fischer (handler) and Kai (dog); Susan K. Vieth (handler) and an unnamed dog; and one final team consisting of an unnamed handler and unnamed dog. *See generally id.* While numerous "cadaver dogs" were deployed, only some of these dogs—Molly, Oso, Selah, Cayenne, Sadie, Darc, Piper, Banner, Kai, Taz, and Callie—had received any type of training in cadaver scent detection. *Id.* at 1323, 2731, 6150, 6345, 16079, 18892, 6173, 6175, 6177. Training and certification logs for the remaining dogs do not exist. *See generally* Discovery. Moreover, only some of the handlers—Mses. Corcoran, Dreves, Birn, Meincke, Berry, and Oliver, and Messrs. Vreeland and Fischer—had received any type of education or training in dog scent detection forensics. *Id.*

On thirteen separate occassions from November 24, 2012, up until June 2013—when Dylan's remains were discovered on Middle Mountain Road—numerous cadaver dogs were deployed in various areas, including in and around Mr. Redwine's home, near Vallecito Lake, and on Middle Mountain Road, to search for Dylan or the scent of Dylan's remains. *See id.* at 461, 475, 492, 534, 707, 6348, 20120-27. In addition, on sixteen separate occasions *after* Dylan's remains were discovered, and continuing into the fall of 2018, numerous cadaver dogs were deployed to search (and re-search) many of these same areas, including additional searches in and around Mr. Redwine's home and property. *See id.* at 595, 638, 681-82, 685, 877, 894, 1366, 1368, 5994-95, 6151-52, 6170-72, 6187, 6189, 11121, 18883-86, 18893. While many of these searches failed to turn up any results, a small number of searches purportedly resulted in positive "alerts" at Vallecito Lake and in or around Mr. Redwine's home. It is the "alerts" in or

around Mr. Redwine's home that the State purportedly hopes to use to tie Mr. Redwine to the commission of a crime in this case.

Specifically, on November 29, 2012, approximately ten days after Dylan went missing, handlers Roy Vreeland, Rae Dreves and Katie Steelman, along with their dogs Cayenne, Selah, and Darc, respectively, conducted a search at Mr. Redwine's house in an attempt to search for the scent of human remains. Discovery at 707, 6348.

Ms. Dreves's dog purportedly entered Mr. Redwine's home first, but came out without alerting to anything in the house, and reportedly "complained that her dog [could not] work in such a smoky house." *Id.* at 706. Ms. Steelman's dog, Darc, entered Mr. Redwine's home next, and is separately alleged to have alerted on a clothes hamper in the master bedroom. *Id.* at 707. Mr. Vreeland and his dog Cayenne then conducted a search of Mr. Redwine's home, with Cayenne reportedly showing an initial interest on the outside stairs and below the stairs in front of Mr. Redwine's home. *Id.* Mr. Vreeland is said to have then gone inside the home and given Cayenne a separate cadaver search command. *Id.* Cayenne allegedly alerted to the scent of human remains on the hamper inside the master bedroom, as well as in front of the washing machine in the laundry room. *Id.*

In addition, and also on November 29, 2012, both Rae Dreves's dog Selah and Ms. Steelman's dog, Darc, allegedly alerted to the scent of human remains on Mr. Redwine's Dodge pickup truck. Discovery at 11121. On the same day, Rae Dreves's dog Selah, and Katie Steelman's dog, Darc, also purportedly alerted on a Chevy pickup truck. Discovery at 11124. It is unclear how the State's theory purports to reconcile separate alerts on the same day to two distinct vehicles.

About a month later, on December 20, 2012, Ms. Kessinger's dogs, Sadie and Jetta, were separately deployed to Mr. Redwine's home, although they did not search inside the residence. Discovery at 200. While the State's discovery documents are not clear as to whether these dogs were searching for "live" scent or the scent of human remains, the dogs purportedly ran around the border of Mr. Redwine's property, but did not alert to any particular scents, although Sadie was apparently interested in a scent in front of Mr. Redwine's home. *Id.*

On August 5, 2013, nine months after Dylan went missing, and approximately one month after his remains had been found, handler Carren Corcoran and her dog, Molly, searched Mr. Redwine's house in an attempt to determine if a human corpse had been present at that location. Indictment. As interpreted by her handler, Molly allegedly "alerted" to the presence of cadaver scent in various locations in both the interior and exterior of Mr. Redwine's home, including the living room, the washing machine, the clothes Mr. Redwine reported wearing on the night of November 18 – 19, 2012, the garage doors, and entry mats on the inside and outside of the house.[1] Indictment; Discovery at 681-82, 1366. Despite these "alerts," Ms. Corcoran observed that "no human remains were observed at [the] location of any indications." Discovery at 2734.

In addition, two days later, on August 7, 2013, Molly searched Bear Creek, a slope below where Dylan's remains were previously located; yet, Molly did not alert to the scent of human remains in this location. Discovery at 680. Subsequently, on February 13, 2014, more than a year after Dylan went missing, Molly allegedly "alerted" to the presence of human cadaver scent in Mr. Redwine's Dodge pickup truck. *See* Indictment; Discovery at 11121.

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[1] On the same day as Molly's August 5, 2013 search, a dog and handler conducted a search of a mound of earth on Mr. Redwine's property. Although unnamed in discovery documents, this dog apparently did not "alert" on the area searched. *See* Discovery at 685.

Other than these dogs' alleged alerts, no physical evidence exists to place the presence of a cadaver in Mr. Redwine's home or pickup trucks, or to link Mr. Redwine to the eventual discovery of Dylan's remains.

Mr. Redwine has now been charged with Murder in the Second Degree, Colo. Rev. Stat. § 18-3-103(1), and Child Abuse, Colo. Rev. Stat. § 18-6-401(1)(a), (7)(a)(I). Indictment. Based on the Indictment The State's case rests heavily upon the proffered testimony of the dogs' handlers, who would presumably testify about their own and their dogs' respective trainings and qualifications, as well as the alleged discoveries the cadaver dogs purportedly made during the investigation.

III.   SUMMARY OF ARGUMENT

For centuries, human beings have relied on certain breeds of dogs to assist in a variety of investigative and recovery efforts because of their perceived olfactory capabilities. Well-trained dogs successfully have aided law enforcement in their efforts to detect bombs, drugs, and other contraband, and have assisted relief workers in locating victims in the aftermath of earthquakes, avalanches, and other natural disasters. In those cases, the detection dogs are familiarized with an object that bears a characteristic smell and are trained to locate a different object that also contains that characteristic smell. In those circumstances, the dog's reliability is rarely in question—it either locates the object or it does not, and the dog's ability to detect (i.e., its error rate) is readily apparent. In such circumstances, even a detection dog with a low rate of success (i.e., a high error rate) may still prove to be an efficient aid to law enforcement, in part because false positives present little risk in light of the ability to weigh the dog's reliability against tangible results.

More recently, however, and without evidence to support such claims, investigators have attempted to use dogs to detect the alleged *past* presence of a human cadaver, at some unknown

point in time and at a location where no cadaver was ever recovered. Unlike in other cases where explosives or contraband are incorporated into the dogs' training regimens, to the best *amicus* is aware, cadaver dogs are not trained in a controlled environment that adequately replicates the real-life conditions inherent in detecting the past presence of human remains, particularly at the lengths of departed time at issue here.

To be sure, the record reflects that not a single dog in this case has been trained to locate the past presence of human remains in a location where a human cadaver was once located *and* where considerable time has passed since its removal. More importantly, even if every dog in this case had been so trained, there is no empirical proof that any of the dogs were successful because no human remains were ever discovered in the locations where the cadaver dogs allegedly alerted. The cadaver dog's handler is therefore left to interpret the dog's "alert" and provide his or her best guess as to what the dog was thinking when it acted. It is *not possible*, in the most objective terms, for a cadaver dog's handler to say, with the indicia of reliability required in a murder trial, that a dog has alerted to human remains at a location where no human remains were found. Indeed, if the cadaver dogs were, in fact, reliable, then the record of their respective alerts should be consistent. But, it is not; it is sporadic, riddled with "misses," inconsistencies, and false alerts, and void of the predictability and reproducibility that are the hallmarks of reliable scientific evidence. While a false "alert" in a natural disaster setting is of little consequence, in the criminal justice system the consequences are enormous—the loss of life and liberty. Where the misapplication of forensic sciences has contributed to nearly half of all wrongful convictions overturned through post-conviction DNA testing, our justice system demands more of such evidence before it can serve as the basis of a criminal conviction.

In the past decade, courts and researchers have come to recognize the inherent limitations

and unreliability of cadaver dog evidence, even as an investigative tool for locating and identifying human remains, to say nothing of attempting to use "alerts" as direct evidence. Indeed, one court presented with evidence that is substantially similar to the evidence at issue here refused to admit against a defendant in a murder trial the uncorroborated evidence of cadaver dog alerts where the dogs used were found to have failed to identify odors left by human remains *more than fifty percent of the time*. *See* Pioneer Press, *Judge: Evidence From Cadaver Dogs Cannot Be Used at Murder Trial*, TwinCities.com (Aug. 31, 2007) ("Pioneer Press"), https://www.twincities.com/2007/08/31/judge-evidence-from-cadaver-dogs-cannot-be-used-at-murder-trial/; Ed Treleven, *Dog's Role in Zapata Case Put to Test: Zapata's Lawyer Seeks to Learn the Dogs' Limits in Finding Human Remains*, Madison.com (Sept. 26, 2006) ("Treleven") (noting defense counsel's examination of handler Carren Corcoran—one of the very handlers in this case—regarding "a list of investigations in recent years in which the dogs erroneously indicated the odor of human decomposition"), *https://madison.com/news/local/dogs-role-in-zapata-case-put-to-test-zapata-s/article_3944488b-4e0a-5451-93c5-c51d3fb7e174.html*.

These results are consistent with recent research on the accuracy of cadaver dog "alerts." For example, in 2011, researchers at the University of California-Davis ("UC-Davis") conducted a detailed study on the accuracy of detection dogs where dog handlers were exposed to biasing information. *See* Lisa Lit et al., *Handler Beliefs Affect Scent Detection Dog Outcomes*, 14 Animal Cognition 387 (2011). In the UC-Davis study, eighteen dog/handler teams were found to consistently alert incorrectly when handlers were led to believe the dogs *should* alert, combining to produce 225 false positive alerts (i.e., where the dogs—all of whom were trained and certified in drugs and explosive detection or both—alerted to no scent whatsoever) over the course of a lengthy study. *Id. See also Clever Hounds: Handler's Expectations May Stop Sniffer Dogs*

Doing Their Jobs Properly, Economist: Babbage Blog (Feb. 15, 2011) ("Clever Hounds"), https://www.economist.com/babbage/2011/02/15/clever-hounds (discussing the UC-Davis study and noting that the "human handlers were not only distracted on almost every occasion by the stimulus aimed at them, but also transmitted that distraction to their animals–who responded accordingly").

With such a low rate of success, the real-world implications of admitting this type of evidence against a criminal defendant in a murder trial is staggering, particularly in cases where no human remains were found at the "alert" locations.

Trial court judges are tasked with a unique responsibility: they must serve as "gatekeepers" concerning the admissibility of science-based evidence and of purported scientific expert testimony related to that evidence. When law and science intersect, judges must exercise their gatekeeping duties with the utmost care. *See General Electric v. Joiner*, 522 U.S. 136, 147 (1997) (Breyer, J., concurring) (Judges are required to make "subtle and sophisticated determinations about scientific methodology and its relation to the conclusions an expert witness seeks to offer."). Judicial discretion over the admission of evidence is particularly critical where, as here, the underlying science is both unreliable and acutely complex, but will be viewed by a jury as common knowledge and treated as fact. Where the evidence offered is unreliable *and* will result in extreme prejudice to the defendant, the court must exclude it.

Accordingly, counsel, urges the Court in this case to exclude any and all cadaver dog evidence, including specifically any evidence purporting to place at any given scene the historical presence of human remains, where no human remains were ever located.

IV. ARGUMENT

A. The Inherent Limitations and Unreliability of Cadaver Dog Evidence Have Been Nationally Recognized by Courts and the Academic and Scientific Communities.

In the nearly twenty years since *Brooks* was decided, courts have recognized that "[t]he infallible dog . . . is a creature of legal fiction" and "the dog that alerts hundreds of times will be wrong dozens of times." *Illinois v. Caballes*, 543 U.S. 405, 411-12 (2005) (Souter, J., dissenting); *accord People v. Cruz*, 643 N.E.2d 636, 662 (Ill. 1994) ("'Neither court nor jury can have any means of knowing why the dog does this thing or another, in following in one direction instead of another; that must be left to his instinct without knowing upon what it is based.'") (internal citations omitted).

Indeed, several states, such as Illinois, Indiana, Montana, and Nebraska, have recognized the inherent unreliability of dog scent evidence and have refused to admit some kinds of dog scent evidence in criminal cases. *See Cruz*, 643 N.E.2d at 662-63 (reaffirming a *per se* prohibition of bloodhound evidence to establish a factual proposition in a criminal proceeding); *Brafford v. State*, 516 N.E.2d 45, 49 (Ind. 1987) ("It has long been held in Indiana that tracking dog or 'bloodhound evidence' is not sufficiently reliable to be admitted into evidence."); *State v. Storm*, 238 P.2d 1161, 1181-82 (Mont. 1951) (holding that "bloodhound testimony" is incompetent and inadmissible against any person accused of a crime); *Brott v. State*, 97 N.W. 593, 594 (Neb. 1903) (holding that dog scent evidence is "unsafe evidence, and both reason and instinct condemn it.").

Moreover, researchers within the academic and scientific communities increasingly have questioned the reliability of canine-indicated scent evidence. *See* Lisa Lit et al., *Handler Beliefs Affect Scent Detection Dog Outcomes*, 14 Animal Cognition 387 (2011) (assessing the influence of handlers on detection dogs and concluding that drug- and bomb-sniffing dogs falsely alerted

well more than half the time when their handlers were given incorrect information about the presence of odors); Caitlin M. Plummer & Imran J. Syed, *"Shifted Science" Revisited: Percolation Delays and the Persistence of Wrongful Convictions Based on Outdated Science*, 64 Clev. St.L. Rev. 483, 495-501 (2016) (discussing arson cases holding that dog alerts to accelerants do not possess the scientific reliability necessary to permit their use as substantive evidence of the presence of accelerants); Jo Craven McGinty, *Making Sense of a Dog's Olfactory Powers*, Wall St. J. (Mar. 24, 2017) (noting that dogs' "accuracy may approach perfection, but it also *may dip to disturbingly low levels"*) (emphasis added); Michael B. Alexander et al. *Application of Soil in Forensic Science: Residual Odor and HRD Dogs*, 249 Forensic Sci. Int'l 304 (2015) (concluding that further research is needed to define the parameters of human remains dogs' capabilities to determine exactly what they are smelling); Dan Hinkel & Joe Mahr, *Tribune Analysis: Drug-Sniffing Dogs in Traffic Stops Often Wrong*, Chi. Trib. (Jan. 6, 2011) (concluding that only forty-four percent of alerts by drug dogs led to the discovery of drugs or paraphernalia in automobiles and that the accuracy rate decreased to twenty-seven percent for Hispanic drivers). These risks are only exacerbated in circumstances like those here, where handlers have no ability to test their dogs against real-world results.

Recently, courts throughout the country have taken a similar approach when faced with improperly admitted cadaver dog evidence. *See, e.g., United States v. Burgos-Montes*, 786 F.3d 92, 116-17 (1st Cir. 2015) (finding that the district court committed error in admitting a handler's cadaver dog testimony and noting that the "prosecution witnesses offered virtually no evidence that the scientific reliability of [a cadaver dog's ability to search for human remains] . . . had been established, or that their investigation protocols were generally accepted for such a use"); *People v Thibodeau*, 106 N.E.3d 1145, 1150 (N.Y. 2018) (discounting the reliability of cadaver

dog alerts on human remains where considerable time had passed after the alleged crime was committed).

In light of the growing consensus that cadaver dog evidence is highly susceptible to error, and the broad recognition that our scientific understanding of dogs' olfactory abilities is limited, state and federal courts across the country have taken appropriate steps to exercise their gatekeeping function over the admission of such evidence to ensure that it is both relevant and reliable, and also that its admission would not be unfairly prejudicial to criminal defendants.

B.   This Court Should Exclude All Cadaver Dog Evidence As Unreliable Under Colorado Rule of Evidence 702, *Shreck*, and *Daubert*.

1.   Legal Standard

Colorado Rule of Evidence 702 governs the admissibility of scientific, technical, and specialized knowledge expert testimony. *Estate of Ford v. Eicher*, 250 P.3d 262, 266 (Colo. 2011); *People v. Shreck*, 22 P.3d 68, 70 (Colo. 2001). Evidence is admissible under CRE 702 only "when (1) the scientific principles at issue are reasonably reliable, (2) the witness is qualified to opine on such principles, and (3) the testimony will be useful to the jury." *Shreck*, 22 P.3d at 79. "The focus of a Rule 702 inquiry is whether the scientific evidence proffered is both reliable and relevant." *Id.* at 77 (citing *Daubert v. Merrill Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 589 (1993)). In addition, the trial court's assessment of reliability "should be broad in nature and consider the totality of the circumstances." *Shreck*, 22 P.3d at 78.

When conducting a CRE 702 inquiry, a court may also consider pertinent *Daubert* factors in its analysis, such as: (1) whether the technique can be and has been tested, (2) whether the technique has been subject to peer review and publication, (3) the technique's known error rate, and (4) whether the technique has been generally accepted in the relevant scientific community. *Shreck*, 22 P.3d at 77-78. Furthermore, the U.S. Supreme Court has made clear that the *Daubert*

factors apply to *all* expert testimony, not merely expert testimony based in science. *See Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 141, 147-48 (1999) (concluding that *Daubert's* general "gatekeeping" obligation "applies not only to testimony based on 'scientific' knowledge, but also to testimony based on 'technical' and 'other specialized' knowledge") (citations omitted); *see also Shreck*, 22 P.3d at 74.

Colorado courts have never considered the admission of the type of dog evidence that is at issue here, and in only one case, *Brooks*, have Colorado courts directly addressed the admission of canine-indicated scent evidence. *Cf. People v. Martinez*, 51 P.3d 1029, 1032 (Colo. App. 2001), *aff'd on other grounds*, 69 P.3d 1029 (Colo. 2003) (the Colorado Court of Appeals held that the trial court committed harmless error in admitting the dog scent evidence, but the Colorado Supreme Court never reached the dog evidence issue). In *Brooks*, police in hot pursuit of a fleeing burglary suspect employed a trained bloodhound to locate a suspect based on the scent of the suspect's footprint. *Brooks*, 975 P.2d at 1107. The bloodhound continuously tracked the suspect's scent from a footprint through a residential neighborhood until, just moments later, it located the suspect hiding in a garage beneath a pickup truck. *Id.* It is no surprise, then, that on such facts the *Brooks* court declined to apply *Daubert* or require assurances as to scientific validity and reliability prior to admitting the scent-tracking evidence in that case, because nothing about the evidence was scientifically relevant or required technical or specialized knowledge to interpret. *Brooks*, 975 P.2d at 1115 (admission of testimony regarding scent tracking by a trained police dog was "experience-based knowledge," governed by CRE 702 and 403, as opposed to the science-focused factors set forth in *Daubert*).

The facts in *Brooks* differ dramatically from those at issue here. Unlike the bloodhound in *Brooks* that located the burglary suspect only minutes after the suspect committed the

burglary, the cadaver dogs in this case were deployed in an attempt to detect Dylan Redwine's cadaver scent days, weeks, months, and even more than a year *after* Dylan went missing, and the State is proposing to offer testimony purporting to interpret the reactions of these dogs to prove the historical presence of human remains where no remains were found. *See generally* Discovery; Indictment.

Perhaps most important, though, is that *Brooks* involved the use of a bloodhound to do no more than locate a person, who was, in fact, subsequently located. As with drug- or bomb-sniffing dogs, the reliability of the dog evidence at issue in *Brooks* can be readily determined based on the existence of a verifiable and reproducible result. By contrast, this case involves multiple cadaver dogs attempting to detect the historical presence of a missing child's remains in areas where no human remains were located.

In other words, unlike *Brooks* or other contexts in which dogs are used, there is no proof here that the dogs were right; in fact, it is *only* the dogs' alerts—which as discussed *infra,* they were not trained to make and which were made under highly suggestive circumstances—and the subjective interpretation of those alerts by their handlers, which ostensibly place Dylan's remains in locations where no remains were ever found.

This key distinction significantly raises the evidentiary stakes in this case. For such evidence to be admissible, it would require that the dogs be adequately trained to detect the past presence of human remains after the passage of the lengths of time at issue here, that the handlers be sufficiently qualified to opine on this specific type of dog scent evidence, and that such testimony be based on accurate and reliable scientific standards. None of these conditions are met in this case.

2.   The cadaver dogs lack the requisite training and qualifications to be deemed reliable evidentiary tools.

The State must demonstrate that cadaver dogs can detect the historical presence of human remains, after the duration of the lengths of time at issue here, and adequately communicate to their handlers that this is what they are identifying (as opposed to any one or more of countless counter-examples, such as a dead or dying deer or other animal carcass, or even the scent of a living human). In this case, the cadaver dogs' lack of training and qualifications raise serious doubts concerning the dogs' ability to detect accurately the past presence of human remains, and adequately communicate to their handlers what they were supposedly detecting after the fact.

The U.S. Supreme Court has held that, even in contexts such as drug detection (where the proof of the pudding is in the eating), a key factor in determining whether a dog's scent detection is reliable, is to assess the dog's training and demonstrated abilities. *Florida v. Harris*, 568 U.S. 237, 246-47 (2013) ("[E]vidence of a dog's satisfactory performance in a certification or training program can itself provide sufficient reason to trust his alert."); *People v. Montano*, 77 N.E.3d 114, 133 (Ill. App. Ct. 2017) *appeal denied*, 89 N.E.3d 761 (Ill. 2017) ("No one suggests that, [in a drug detection case], without the actual drugs, the dog alerts and corroborating eyewitness testimony would have been sufficient to prove the corpus delicti of the drug offenses.").

Several other courts, including the Colorado Supreme Court, also have indicated that even dog *tracking* evidence—which has been offered to prove far less than what the State is attempting to assert here—is admissible only upon a proper foundational showing that the dog has been specifically trained to detect human scent. *See People v. Lane*, 862 N.W.2d 446, 457 (Mich. Ct. App. 2014) (cadaver dog was *"trained to search for and detect* the odor of decomposing human remains," while the other dog was "trained to search for and locate

specifically human blood." (emphasis added))[2]; *Trejos v. State*, 243 S.W.3d. 30, 50 (Tex. App. 2007) (admitting cadaver dog alerts from the known site of a murder where one of the dogs had attended at least ten different training seminars in addition to training several times each week; one dog was certified by two local organizations and a national organization; and the dog's handler indicated that he had never known the dogs to alert to a false positive); *Brooks v. People*, 975 P.2d at 1114. *See also People v. Jackson*, 376 P.3d 528, 569-70 (Cal. 2016) (admitting a dog handler's testimony that she and the dog had undergone training geared specifically toward trailing human scent).

In this case, numerous dogs were deployed not just to track, but to locate Dylan Redwine's remains. In other words, all of the cadaver dogs had concrete tasks: to attempt to alert to the fact that a human had died, and that the deceased body was present at a specific location, even if only temporarily, and to communicate this fact, if established, to their handlers. Yet, unlike the cases just discussed, there is scant evidence that would demonstrate that these dogs were specifically trained and qualified to detect the past presence of a specific individual's remains, that they could sufficiently communicate the substance of their detection to their handlers, or that their handlers are able to adequately interpret their animals' alerts as reflecting one specific result among many other equally plausible alternatives.

Cadaver dog training must of course be demonstrated to be capable of producing the specific results being offered by the State, and here that training must be able to demonstrate that cadaver dogs are capable of detecting lingering cadaver scent in locations where no cadaver has

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[2] The missing child in *Lane* has never been found, and since her disappearance, has been seen alive by multiple people, including a police officer. Kevin Dietz, *Witnesses Say Baby Ruled Dead In Father's Murder Trial 6 Years Ago Is Still Alive*, ClickOnDetroit.com (Jan. 16, 2018), https://www.clickondetroit.com/news/defenders/witnesses-say-baby-ruled-dead-in-father-s-murder-trial-6-years-ago-is-still-alive.

ever been found. Here, the State has not submitted training logs that demonstrate any training for detection of lingering scent left by a cadaver in a locfation for a very short time. Accordingly, there is no way this Court would know whether these dogs underwent lingering residual human scent detection training, let alone cadaver-specific training designed to alert to the historical presence of human remains, and to do so days, weeks, months, or even more than a year *after* an individual went missing.

Similarly, how will this Court evaluate sufficiently the reliability of the cadaver dog evidence if there is no indication that the dogs were trained to detect residual cadaver scent or historical human remains? Or to distinguish lingering cadaver scent from the scent of human blood, or that of other naturally occurring decomposition, such as that of animal remains or cooking refuse? Or that such training would be sufficient to allow such detection after the fact, in locations where no cadavers were ever found? This lack of evidence concerning some of the dogs' scent detection abilities should, by itself, be enough for this Court to render the evidence inadmissible.

These questions are relevant for even the arguably best "qualified" dog, handler Carren Corcoran's dog, Molly, who has received training in cadaver scent detection and purportedly possesses certain cadaver certifications. Discovery at 1323, 2731. Perhaps for this reason, the State relies heavily on Molly's findings in proving the Defendant's alleged guilt. *See generally* Indictment. Still, there is little evidence concerning the particular facts of Molly's training, including as to the key question—whether or not she can reliably identify the historical presence of cadaver scent—at locations where physical remains were never found, months and even more than a year *after* those remains were ostensibly present. Without evidence that Molly can do reliably this task, her cadaver training means little.

Molly's handler herself has acknowledged some of the difficulties that dogs have in determining accurately the past presence of human remains: "While an HRD [human remains detection] dog can differentiate between animal and human blood, they *cannot* assist in determining if the blood at a crime scene came from a victim who was alive or a victim who was deceased." Carren Corcoran, Canine Search Solutions, *HRD Canines: Using the Tool* http://caninesearchsolutions.com/HRDtool.html (emphasis added); *see also* Treleven (citing testimony by Ms. Corcoran in another case, in which she reportedly acknowledged that cadaver dogs' erroneous indication of human decomposition could be caused by extraneous factors, including "Indian burial mounds" or the "site of a past accident"); *see also* Pioneer Press (reporting comments from a Dane County, Wisconsin District Court Judge in a case where the prosecution sought to introduce cadaver dog evidence from Ms. Corcoran, *State v. Zapata*, 2006-CF-001996 (Wis. Cir. Ct. Aug. 28, 2006) ("*Zapata*"), "The state has failed to convince me that it's any more reliable than the flip of a coin"); Mike Miller, *Key Info on Dogs Won't Air at Zapata Trial*, Capital Times (Sept. 1, 2007) (reporting that, in *Zapata*, the Court "adopted the findings of a Colorado court in a case in which tracking dogs found a burglary suspect," and that "prosecutors, to get in the evidence of the dogs, had to show the dogs were of breeds that had powerful senses, that they were properly trained, that they were reliable, and that the 'hits' they made could be corroborated by independent evidence"). In *Zapata*, one of the prosecution's own expert witnesses reportedly "found that two dogs used in the search by Madison Police Officer Carren Corcoran," and a third dog used by a separate handler, were unreliable 76 percent of the time, 71 percent of the time, and 62 percent of the time, respectively. The *Zapata* court, applying *Brooks*, granted the defendant's motion to exclude Ms. Corcoran's testimony and all other evidence related to canine searches and alerts. In so doing, the *Zapata* court was clear that

Ms. Corcoran's dogs "have not been found to be reliable in responding to the scent of human remains . . ." *State v. Zapata*, No. 2006-CF001996, at *3 (Wis. Cir. Ct. Aug. 31, 2007) (Unpublished) (Enclosed as Appendix A). The record here is no different; it contains no indications that Molly is capable of reliably alerting to the past presence of human remains—at locations where physical remains were never found.[3] And, even if Molly generally can detect cadaver scent where remains are present, admissibility of such evidence requires a demonstration that she can do so in the circumstances relevant to this case.

The requisite training and qualifications for dogs Selah, Darc and Cayenne—the other dogs that the State hopes to rely upon to place Dylan's remains in locations inculpating Mr. Redwine—are similarly lacking in demonstrated reliability under these circumstances. For instance, Handler Rae Dreves's dog Selah—in addition to an apparent limitation in locations where smoke has been present—was apparently cross-trained in "live tracking" and "human remains searches." Discovery at 16019. But this type of training may limit the dog's efficacy in tracking cadaver scent because the dog may not be able to discern accurately cadaver scent, or to properly distinguish in its alerts the presence of a cadaver vis-à-vis the past presence of other human scent. Discovery at 16079. The dog, for instance, may confuse live human scent with cadaver scent, and vice versa. *See* Carren Corcoran, Canine Search Solutions, *Homicide,*

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[3] Corcoran's self-proclaimed reliability rate for Molly is ninety-one percent, but her training records do not specify the circumstances of her training, namely whether the dog has been tested on the detection of lingering cadaver scent where human remains were once present, after the expiration of intervening time lasting from multiple months to up to a year, and without handler bias. Indeed, Molly's credentials do not indicate whether her reliability has been tested independently by an unbiased source other than her handler, as occurred in the *Zapata* case. *See* Discovery at 16562-63. In fact, in the area near where Dylan's remains were actually found (at Bear Creek), Molly failed to alert to the scent of human remains, which demonstrates that the primary dog on which the Prosecution relies has ocassionally proven to be unreliable. *Id.* at 680. The self-reported "success rate" of ninety-six percent for Darc suffers from the same deficiencies. *Id.* at 22107.

http://caninesearchsolutions.com/Homicide.html ("In the case of a homicide, [Canine Search Solutions] most often recommends a dog trained exclusively in HRD and not cross trained in other disciplines such as live scent or narcotics, to circumvent potential legal obstacles in court later").

Similarly, Roy Vreeland's dog, Cayenne, although purportedly trained as a cadaver dog, has been formally trained only to detect "live human scent." Discovery at 6344-45. For instance, Cayenne received Search and Rescue training from one Jane Adair, a trainer with experience working with Search and Rescue ("SAR") dogs for searches with FEMA—in the natural disaster context—and thus not searches for the residual scent of human cadavers at issue here. Discovery at 6344. In addition, Mr. Vreeland apparently does not keep a record of the searches that Cayenne was involved in; yet, he claims that Cayenne had logged "thousands of miles" and has been involved in "hundreds of searches" in SAR operations. Discovery at 6345. Thus, Cayenne's reliability to search for cadaver scent—which was reportedly tested "in the field" for the first time during this case—has not been subjected to independent, formal testing. Cayenne's only qualifications as a cadaver dog appear to be that Mr. Vreeland *himself* has trained Cayenne using items such as donated human placentas, teeth, and blood; Mr. Vreeland's training of Cayenne as a cadaver dog is purportedly "hands on" and informed by Mr. Vreeland's reading of articles concerning the training of search dogs for human remains. Discovery at 6344-45.

Notably absent are training logs for these canine-handler teams indicating that these dogs were trained to search residual decomposition scent. Therefore, this Court cannot evaluate sufficiently the reliability of the dog scent evidence if there is no indication that the dogs were trained to detect the past presence of a cadaver. By contrast, there was evidence that the dog in

Brooks had been trained to do exactly what he was asked to do in that case—locate an individual by scent—and had done so accurately in over ninety-five percent of its training sessions. *Brooks*, 975 P.2d at 1107, 1115 (bloodhound had been trained by exposing the dog to an object handled by a target individual, then requiring the dog to locate the individual).

Moreover, in such instances, the adequacy of the proof offered has a built-in check for reliability in that the locating of the targeted individual serves as an indicator of the work being performed by the dog. In this case however, there is no evidence of the dogs' respective abilities to detect the past presence of a human cadaver where an individual was purportedly present, after the passage of the lengths of time at issue in this case. And, unsurprisingly, courts across the country have refused to admit canine-indicated scent evidence on similar grounds where the handler failed to provide any supporting evidence that the dogs were reliable. *State v. Smith*, 335 S.W.3d 706, 712 (Tex. App. 2011) (declining to admit dog-sniff evidence on relevance grounds where handler testified that his dogs were reliable, but dogs' records were incomplete and dogs' success rates were unverified); *People v. Mitchell*, 2 Cal. Rptr. 3d 49, 66 (Cal. Ct. App. 2003) (concluding trial court improperly admitted scent line up, explaining "[f]or scent identification to be relevant, there must be some basis for assumptions made about degradation and contamination of scent, both before and during collection, as well as the uniqueness of each person's odor, beyond the mere experiences of one trainer and one dog.").

In short, there is little evidence demonstrating the dogs' abilities to accurately detect residual cadaver scent and the proffered cadaver dog evidence therefore fails to meet the standards of reliability necessary for the admission of scientific evidence under *Shreck* and CRE 702.

3.   <u>Handler bias has been demonstrated to have a significant impact on a cadaver dog's results, producing false positives in circumstances where no controls have been put in place to prevent handler bias.</u>

In addition to the serious deficiencies with the dogs' training described above, this case also presents serious issues with the other half of the equation: the handlers and their ability to interpret the purported "alerts" of their dogs. This piece is critical, because a key issue in dog scent evidence, which has led at least one court to reject it in its entirety, is the fact that "'[n]either court nor jury can have any means of knowing why the dog does this thing or another...'" *Cruz*, 643 N.E.2d at 662 (quoting *People v. Pfanschmidt*, 104 N.E. 804, 823 (1914) quoting *Brott v. State*, 70 Neb. 395, 97 N.W. 593, 594 (1903)) ("The information obtainable on this subject, scientific, legal or otherwise, is not of such a character as to furnish any satisfactory basis or reason for the admission of this class of evidence. * * * [T]he 'conclusions of the blood-hound are generally too unreliable to be accepted as evidence in either civil or criminal cases.'").

Only the handler is, in theory, able to bridge this gap for the jury, to break down the mystery of the dog's alert. Indeed, the ultimate reliability of a cadaver dog's "alert" depends upon a handler's ability to accurately interpret the dog's signaling. Yet, research into the effects of cognitive bias in dog evidence demonstrates that there is a significant possibility that such bias can result in unreliable evidence, particularly where no steps have been taken to control for potential biases in a cadaver dog's searches. This can occur when a dog handler "cues" a specific "alert" for results that the handler subconsciously, or even consciously, seeks to see borne out. Such biases may be driven by the desire to "do good" or "seek justice," to aid in the work of law enforcement, or simply to obtain the results that a handler seeks to achieve after putting in many hours of hard work training a cadaver dog, who in many instances will also be a companion animal with a vested interest in pleasing its master. Or, it may be entirely subconscious and triggered by mere exposure to contextual information, a phenomena that has

been observed in techniques far more reliable than dog evidence, including DNA and fingerprint testing. *See* President's Council of Advisors on Science and Technology, Executive Office of the President, Report to The President: Forensic Science In Criminal Courts: Ensuring Scientific Validity Of Feature-Comparison Methods at 31 (2016) (describing studies "demonstrat[ing] that the judgment of latent fingerprint examiners can be influenced by knowledge about other forensic examiners' decisions (a form of confirmation bias)," which have been "replicated . . . in other forensic domains, including DNA mixture interpretation, microscopic hair analysis, and fire investigation").

Cuing in particular is likely to arise where a handler believes that the historical scent of human remains were present in a particular location, and then directs a cadaver dog, through subtle or even unsubtle cues, to alert in that location. This is often referred to in scientific literature as the "Clever Hans Effect," deriving its name from a horse, "Clever Hans," that was widely believed during the early twentieth century to have been capable of solving mathematical calculations, reading a clock, and counting, among other "talents." Lassya Samhita & Hans J. Gross, *The "Clever Hans Phenomenon" Revisited*, 6 Communicative & Integrative Biology, Nov. – Dec. 2013, e27122-1. Despite an apparent tendency in human nature to want to believe such heartwarming stories, a psychologist subsequently discovered, that the horse's perceived intellectual abilities were false, and that in fact the horse's *handler* was actually gesturing and providing facial cues to the horse, compelling in various ways the horse's response to its handler's cues and gestures. *Id.* It is important to note that no malice need be ascribed to a handler for cognitive bias to do its pernicious work in any context, and perhaps even especially here, where "given the social cognitive abilities of the domestic dog, it is possible that even

highly trained dogs might respond to subtle, unintentional handler cues," which handlers may well be completely unaware of providing. Lit et al., 14 Animal Cognition at 388.

More recent research has further supported the phenomena of handler cuing in dog evidence, showing that handler beliefs about the presence or absence of a target scent significantly affects the error rate of detection dog alerts. For example, in the aforementioned 2011 UC-Davis study, researchers falsely suggested to dog handlers that several locations contained drug or explosive scent markers, when in fact, none of the target locations contained such markers. *See* Lit et al., 14 Animal Cognition at 390. The eighteen drug- and bomb-sniffing dogs studied by the researchers were well-trained and certified, and yet racked up a total of 225 false alerts throughout the study (amounting to only 21 clean search runs—approximately 15 percent—out of a total of 144 search runs). *Id.*; *see also* Clever Hounds ("To mix metaphors, the dogs were crying 'wolf' at the unconscious behest of their handlers."). The dogs' combined efforts were less accurate than a coin flip.

The circumstances in this case provide ample opportunity for similar handler cuing and bias. For example, the handlers instructed their dogs to search only a few distinct locations tied to a predetermined suspect, identified by law enforcement, with the focused "goal" of attempting to detect the scent of human remains. No blind searches appear to have been conducted, and overall, the compendium of locations searched by the dogs was relatively limited. For example, throughout the investigation, the dogs primarily searched only a small number of locations: Mr. Redwine's home and its immediate border, an area near Vallecito Lake, Mr. Redwine's Dodge and Chevy pickup trucks, and later on Middle Mountain Road, in the vicinity of where Mr. Redwine lived—where some dogs allegedly alerted to the presence of human remains, but only *after* Dylan's remains eventually were found (thus presenting bias issues of its own). *See*

generally Indictment, Discovery. While the dog Oso on one occasion searched a drainage area around Runlett Park, and the dogs Sadie and Jetta separately searched on one occasion Blue Spruce RV park, the handlers in those isolated incidents determined their dogs' respective "alerts" were inconclusive as to whether human remains scent was detected (thus further demonstrating the self-selecting, and self-serving, nature of the State's dog evidence in this case). Discovery at 6151, 200.

Plainly, the handlers here had every reason to believe that law enforcement hoped that their dogs would "alert" on the scent of human remains in most of the locations they searched, and like the dogs who falsely alerted routinely in the UC-Davis experiment, the dogs in this case may also have falsely alerted—fifty percent, seventy-five percent, or even one hundred percent of the time. There is simply no way of knowing.

Problems inherent in relying on the black box of a dog's nose can only be exacerbated here where the handlers lacked any scientific expertise or qualification to describe exactly *how* cadaver dogs might (in theory) be capable of detecting and distinguishing the smell of human remains from the smells of animals, human and non-human blood, remnants of living people, and other biological material, as well as how the handlers might possibly be able to distinguish among alerts on any of these various categories. By contrast, in other cases where courts have admitted this testimony, the jury was provided with at least an opportunity to hear some evidence regarding how, in theory, a dog's alerts were justified.[4] While such testimony or expertise could

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[4] *See, e.g., Clark v. State*, 781 A.2d 913, 935 (Md. Ct. Spec. App. 2001) (Director of the Identification Unit of the Boston Medical Examiner's Office was qualified as an expert in the field of forensic anthropology and the identification of human remains, and "testified at a motion *in limine* hearing that the fact that a cadaver dog alerted at a certain spot was 'not enough by itself' to prove the presence (or presence at some time in the past) of human remains to a reasonable degree of scientific certainty"); *see also United States v. $49,790 in U.S. Currency*, 763 F. Supp. 2d 1160, 1165-66 (N.D. Cal. 2010) (conducting *Daubert* analysis on dog handler);

not, on its own, overcome the lack of reliable empirical evidence supporting a dog's alerts, without it, a jury is left even more beholden to the complete black box of the dog's nose.

Given the lack of proper training and certification credentials of the dogs and their handlers; the inconsistent results and false alerts by the dogs; the inability of the dogs to distinguish among different types of biological material; and the inability of the dogs' handlers to tell with any degree of certainty what, if anything, caused the dogs to alert—or if the dogs even alerted in the first place—there is simply no way to discern whether the dogs' actions were deliberate or innocuous, or if the handlers have instead consciously or subconsciously steered the results of their dogs' purported signaling.

> 4. The cadaver dogs' alerts were not corroborated sufficiently by other evidence which would indicate that Mr. Redwine was connected with the discovery of Dylan's remains.

The cadaver dogs' limited findings were not sufficiently corroborated by other evidence linking the dogs' purported findings to the eventual discovery of the remains. This further demonstrates that the dogs are unreliable evidentiary tools in this context.

Courts have repeatedly required evidence to corroborate dog evidence alerts, even in contexts more facially reliable than here. For example, even where dog *tracking* evidence has been found admissible, many states, including Colorado, have stated that such evidence, standing alone, is insufficient to support a criminal conviction. *See, e.g., Brooks*, 975 P.2d at 1114; *People v. Gonzales*, 217 Cal. Rptr. 138, 143 (Cal. Ct. App. 1990); *Clark*, 781 A.2d at 933. *See also State v. Loucks*, 656 P.2d 480, 481-82, 483 (Wash. 1983) (overturning appellant's conviction because the police dog tracked a burglary suspect, but DNA analysis found at

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see also Mitchell, 2 Cal. Rptr. 3d at 66 (applying *Kelly*, the state's *Daubert* equivalent, to exclude cadaver dog evidence improperly admitted where there was no foundational basis for "assumptions made about degradation and contamination of scent . . . as well as the uniqueness of each person's odor, beyond the mere experiences of one trainer and one dog.").

victim's home did not match the suspect's DNA); *People v. McPherson*, 271 N.W.2d 228, 229-30 (Mich. Ct. App. 1978) (excluding the dog tracking evidence because it was the only inculpating evidence against the defendant) (internal citations omitted).

If dog tracking evidence is to be admitted at all, it must be corroborated by other evidence supporting the accuracy of the inferences a jury would draw from it, and which would thus identify the accused as the perpetrator of a crime. *See Brooks*, 975 P.2d at 1114; *Gonzales*, 267 Cal. Rptr. at 144-45; *Clark*, 781 A.2d at 933; Loucks, 656 P.2d at 482.

In *Brooks*, the Colorado Supreme Court admitted the scent tracking evidence because, among other reasons, the court found that the dog's tracking and subsequent identification of the defendant were corroborated sufficiently. *Brooks*, 975 P.2d at 1115. The court concluded that there was substantial evidence supporting the dog's finding, including the fact that the police officers in hot pursuit of the defendant ultimately found the defendant in a nearby garage, which was the location where the dog had also tracked and discovered the defendant. *Id.*

Similarly, but in a case with contrasting facts, the California Court of Appeal in *Gonzales* overturned the appellant's conviction, finding that the dog tracking evidence prejudiced the defendant because it was not corroborated adequately. *Gonzales*, 267 Cal. Rptr. at 145. In that case, although the scent that the dog tracked led to the discovery of the appellant, the court nonetheless held that it was reversible error to admit the evidence, reasoning that each piece of allegedly corroborating evidence offered to prove the appellant's guilt, including the defendant's alleged footprints and other seemingly identifiable characteristics, was attenuated from the inference necessary to support the accuracy of the dog-tracking evidence. *Id.* In other words, the court found that the other evidence was too weak to countenance the dog-tracking evidence.

Such corroboration has also been required in the cadaver dog context. In *Clark*, the Maryland Court of Special Appeals concluded, several years after she had disappeared, that a six-year-old girl had been murdered. *Clark*, 781 A.2d at 952. In that case, two cadaver dogs purportedly alerted to the scent of human remains in a cemetery, a key crime scene in the case. *Id.* at 921. The court found that the dogs' alerts were corroborated, and thus admitted the cadaver dog evidence, because there was other circumstantial evidence that pointed to the fact that there had been a clandestine burial at the spot, such as: a considerable amount of blood and DNA evidence found in the cemetery where the homicide occurred, eyewitness testimony placing the defendant at the cemetery, and a map in the defendant's truck with an asterisk on the specific location at issue in the cemetery. *Id.* at 935.

In this case, the State has identified no such corroboration, not least because no relevant physical evidence was found where the dogs alerted. Specifically, the places where the dogs searched, namely Mr. Redwine's home and trucks, were not where the human remains eventually were found.[5] For instance, several months after Dylan Redwine disappeared, handler Carren Corcoran's dog, Molly, in theory the most "qualified" dog in the investigation, indicated the presence of cadaver scent in various locations in Mr. Redwine's home, such as the living room, washing machine, and the clothes Mr. Redwine reported wearing on the night of Dylan's disappearance. Indictment. Yet, unlike *Brooks* and *Clark*, where the courts in those cases admitted the testimony related to the dogs because there were significant pieces of corroborating evidence linking the defendant to the crime, in this case, Dylan's cadaver was not discovered in and around Mr. Redwine's home or pickup trucks—the primary locations the dogs searched.

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[5] To the extent that later dogs alerted to the area near where Dylan's remains were actually discovered, there is no dispute that the remains had in, fact, been previously recovered there.

Rather, his remains and skull were discovered on Middle Mountain Road, approximately eight miles from Mr. Redwine's house. Indictment.

The lack of corroborating evidence which purportedly would link Mr. Redwine to a crime provides even more reason for this Court to exclude the cadaver dog evidence.

C. The Probative Value of the Cadaver Dog Evidence Is Substantially Outweighed by the Danger of Unfair Prejudice and Should Be Excluded Under Colorado Rule of Evidence 403.

Subjecting Mr. Redwine's liberty to the caprices of dog scent evidence is not only dangerous, but also highly prejudicial, and even if this Court finds that the proffered cadaver dog evidence is admissible under CRE 702, it should be excluded under CRE 403. The State's proffered expert testimony is prejudicial, at least in part, because of the significant weight jurors give to scientific evidence. *See State v. Bible*, 858 P.2d 1152, 1181 (Ariz. 1993) ("Because 'science' is often accepted in our society as synonymous with truth, there is a substantial risk of overweighting by the jury."). *See also* David L. Faigman et al., Modern Scientific Evidence: The Law and Science of Expert Testimony § 3:19 (2017-2018 ed.) ("A review of research on 'social framework' expert testimony found that jurors give considerable weight to [scientific and technological expert evidence].").

In fact, jurors often give canine-indicated scent detection evidence, in particular, undue weight when evaluating its credibility, sometimes unconsciously accepting its reliability. *See Cruz*, 643 N.E.2d at 662 ("It is well known that the exercise of a mysterious power not possessed by human beings begets in the minds of many people a superstitious awe. The very name by which [a bloodhound] is called has a direct tendency to enhance the impressiveness of the performance.") (citations omitted); *see also* 81 A.L.R.5th 563 § 2[a] ("Furthermore, the jury, due to the superstitious awe with which many people regard the actions of animals, is likely to give more weight to such evidence than it is entitled to . . . ."). To compound this phenomenon, juries

tend to give undue weight to dog scent evidence when it involves allegations that an egregious crime has been committed and which garners significant media attention, as is the case here regarding the murder and child abuse charges Mr. Redwine faces. *See McPherson*, 271 N.W.2d at 230 (explaining that juries "are likely to give more weight to [bloodhound] evidence than it is entitled to, particularly where it is introduced in connection with some heinous crime about which there has been much public indignation and excitement." (quoting 81 A.L.R.5th 563 § 2[a]))). Concerning dog scent evidence, specifically, juries tend to believe, almost automatically, that because dogs are routinely used in other kinds of criminal investigations and possess unique olfactory abilities, dog scent evidence is almost always trustworthy and reliable when offered into evidence in criminal trials.

The fact that dogs' olfactory abilities are, of course, unique, and allow them to detect scents imperceptible to humans and other animals, such as illegal drugs, explosives, and other contraband items, only exacerbates the tendency to credit them. *See, e.g., Florida v. Jardines*, 569 U.S. 1, 13 (2013) (Kagan, J., concurring) ("Like the binoculars, a drug-detection dog is a specialized device for discovering objects not in plain view (or plain smell)"); Frank Rosell, Secrets of the Snout 6 (2018) ("The dog has a very keen sense of smell, which has been used in the service of humans for many thousands of years."). But those abilities have limits, which, as explained previously, courts and academics have increasingly recognized, and the scientific community's overall knowledge about such abilities is sparse. *See, e.g.,* Jo Craven McGinty, *Making Sense of a Dog's Olfactory Powers*, Wall St. J. (Mar. 24, 2017) ("We accept that dogs have sharp noses . . . But our knowledge of the limits of their abilities is scant."); Cat Warren, What The Dog Knows: The Science and Wonder of Working Dogs 28 ("The truth is, we don't know much about [dogs' sense of smell]."). When those limits are exceeded, as here, the fair

administration of justice is threatened. *See Hinton v. Alabama*, 571 U.S. 263, 276 (2014) ("[S]erious deficiencies have been found in the forensic evidence used in criminal trials . . . One study of cases in which exonerating evidence resulted in overturning of criminal convictions concluded that invalid forensic testimony contributed to the convictions in 60% of the cases." (quoting *Melendez-Diaz v. Massachusetts*, 557 U.S. 305, 319 (2009))).

As the foregoing demonstrates, cadaver dog evidence of the type at issue here is particularly prone to error, and the credit given to dogs extended in other circumstances is not warranted here. As the U.S. Supreme Court has noted, evidence may be excluded if it "is so extremely unfair that its admission violates fundamental conceptions of justice." *See Perry v. New Hampshire*, 565 U.S. 228, 237 (2012). Likewise, under Colorado Rule of Evidence 403, evidence may be excluded if "its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence." Colo. R. Evid. 403. The limited probative value of dogs, which may be no more accurate than a coin flip, is easily outweighed here by the potential for undue prejudice.

In this case, Mr. Redwine's life and liberty should not be put into jeopardy based on proffered testimony regarding the alleged cadaver dogs' alerts, where such evidence is used as the crucial link between a defendant and the commission of a crime. Once again, there is very little evidence which would establish that the dogs can detect whether Dylan's remains were historically present in a specific location. Such evidence, under CRE 403, is thus likely to prejudice Mr. Redwine because it would mislead the jury into believing that the dog scent evidence is virtually impenetrable to error and thus reliable. The jury's search for the truth,

however, is not advanced by the introduction of speculative evidence masquerading as valid and reliable expert testimony.

The jury in this case, while instructed to view all evidence presented in the case impartially, may nonetheless view the dog scent evidence with allure, and would thereby give it undue weight, especially considering the tragic nature of Dylan's death and its extensive publicity in the media. The growing consensus around the shortcomings of dog-based expert testimony suggests, then, that such testimony should be seriously questioned, especially when such evidence is proffered to prove guilt, as is the case here against Mr. Redwine.

Therefore, under Colorado Rule of Evidence 403, because the prejudicial effect outweighs its probative value (if any), the cadaver dog evidence offered by the State should be excluded.

V.   CONCLUSION

For the reasons stated above, this Court should exclude the cadaver dog evidence offered in this case.

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Respectfully submitted,

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I hereby certify that I served the foregoing document by e-filing same to all opposing counsel of record. /s/   john moran____