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Sharon J. Daniels
Editor-in-Chief

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Preface

On behalf of the Energy and Mineral Law Foundation (EMLF), I am proud to present to you a compilation of the outstanding papers prepared in conjunction with the 36th Annual Institute of the EMLF held on June 21-23, 2015 at the Omni Amelia Island Plantation Resort in Florida.

The EMLF continues to attract a talented group of experienced energy law practitioners as reflected in the quality of research and resource material included in this volume.

The contributions to this year's edition reflect the continuing efforts of many volunteers who serve the EMLF with dedication and distinction. In particular, our Annual Institute Program Chair was Daniel W. Wolff, the Oil and Gas Chair was Joseph K. Reinhart and the Coal Chair was M. Shane Harvey.

My personal gratitude is extended to each of them for their hard work, good judgment and oversight in developing an outstanding program.

The EMLF extended its programming reach in 2015 by developing what we believe was the first ever stand-alone Midstream Conference in the Appalachian Basin. The Midstream Conference was held in April of 2015 in Canonsburg, Pennsylvania and was developed and chaired by Natalie N. Jefferis.

Our calendar of events also included the annual Kentucky Mineral Law Conference in October in Lexington. This conference was ably chaired by Timothy J. Hagerty, with Amber Nisbet Hodgon serving as Oil and Gas Chair and Nick S. Johnson as Coal Chair.

Each of these programs was well attended and continued the EMLF's reputation for excellent program content.

The EMLF excels in large part due to the devoted leadership of Executive Director Sharon Daniels, who has guided the EMLF for decades. Sharon is the heart and soul of the EMLF.

She receives excellent support from Carolyn B. May, long time CLE and Membership Coordinator. Sharon's commitment to the EMLF is unwavering as she pushes the organization toward an evolving and bright vision for the future.

In that regard, Sharon coordinated the development of the organization's 2014 strategic plan that resulted in the creation and revival of various subcommittees.

For example, despite challenging times for the energy industry, the EMLF added several new members in 2015 in large part due to the efforts of the Membership Committee led by co-chairs Joseph Tarantelli and Frank B. Harrington.

Our Programming Committee focused on developing long range planning for sustainable programming and was chaired by Daniel Wolff. The Law School Committee worked to enhance the organization's relationship with member law schools and was chaired by Natalie Jefferis. The Leadership Planning Committee was chaired by David Morrison and focused on succession planning. Our Governance Committee (which focused on reviewing the organization's by-laws) was chaired by Timothy Gresham. Finally, our Finance Committee, chaired by Erin Magee, continues to be a fine steward of the EMLF's endowment and other funds.

The EMLF also benefits from the service of a strong and dedicated Executive Committee that has successfully guided the organization through the challenging times facing the energy industry.

The EMLF remains fiscally strong and is dedicated to exceeding the expectations of its members and expanding its energy reach beyond traditional oil and gas and coal energy areas. We were pleased to award $50,000 in scholarships to deserving law students and to visit law schools throughout the country to promote careers in energy law.

The year was marred by the sudden death of one of our Executive Committee members, Russell L. Schetroma. Russ had been a devoted member and contributor to the EMLF for decades and the impact of his loss to the organization is difficult to overstate.

In fact, Russ's devotion to the EMLF will continue in perpetuity because his estate created a trust to assist law students with the expenses associated with attending future EMLF Annual Institutes. Separately, the EMLF has also set up a special Legacy Fund to honor Russ and other dedicated members of the EMLF who have passed away. A special tribute to Russ prepared by J. Thomas Lane is included in this edition.

I want to acknowledge once again the dedication and assistance of the EMLF's strong Executive Committee, Officers, Program Chairs, Executive Director and staff, and countless members who have given of their time and resources. In fiscal 2016, I am pleased that Vice-President/President-Elect G. Brian Wells assumes the responsibility for ably leading the EMLF during times of change and challenge.

We hope you will continue to support the EMLF and we thank the sustaining and other members of the EMLF for your financial as well as professional support.

Kevin K. Douglass
Babst Calland
President, 2014-2015

Each presentation surpassed the last one. In short time, the ancillary problem that arose was that no one wanted to be slotted to speak opposite the slot Russ had.

Russ taught each of us many lessons; he enriched our lives and his superb papers will endure long into the future as a valuable resource.

When our dinner speaker could not show, Russ filled in at this annual dinner just one year ago and provided an insightful history of the EMLF.

Russ' scholarship was not limited to the EMLF. He published law review articles in the *Dickinson Law Review,* the *Annual Proceedings* of the Rocky Mountain Mineral Law Foundation and gave a multitude of presentations at special institutes and other venues.

As a lawyer, Russ was a founding member of Culbertson, Weiss, Schetroma and Shug, Meadville, Pennsylvania (1972 – 2010). In August 2010, his firm merged with Steptoe & Johnson where Russ served as the managing member of the Meadville and Houston offices and on the firm's Executive Committee.

Russ embraced his new firm and it seemed Russ' horizons expanded and his opportunities were unlimited at Steptoe. He grabbed hold tight and took full advantage.

Despite the demands of a busy practice and schedule, Russ undertook pro bono legal work and received special recognition from the Pennsylvania Bar Association.

His civic life in his hometown of Meadville was rich and Russ was fully engaged. For 35 years he served the town as solicitor. In this capacity he voluntarily drafted the municipal code for Third Class Cities in Pennsylvania.

Russ was an active member of the Stone United Methodist Church in Meadville where he served many years as a lay leader.

In addition to being recognized by the Pennsylvania Bar for Outstanding Contributions to Pro Bono Services, he was selected as a top lawyer by *Best Lawyers in America* and most significantly Russ received the John L. McClaugherty Award, the highest honor and recognition made by this Foundation.

Russ' untimely death prompted many members of this Foundation to seek a means to remember Russ with a financial contribution. The result was the creation of the EMLF Legacy Fund which will be a permanent vehicle for members and friends to make living and testamentary contributions to the EMLF. A permanent tribute has been recorded for Russ with a dedicated account which is expected to reach $14,000 in the near future.

The fund can be used at the discretion of the Executive Committee with special consideration given to providing stipends for law students for research and writing, to funding research, presentations and writing by professors or other recognized speakers and for scholarships.

Through hard work and scholarship, Russ made himself one of those we call the top one percenters.

As lawyers and landmen we come to know intimately who the really good lawyers are, the go-to people if we need good advice. Russ was that kind of lawyer.

This room, though, is filled with members who follow Russ' example of scholarship. I suggest that by your attendance here and your scholarship you, also, are top one percenters.

This Foundation has a primary goal of education, and accomplishes it in spades with members like Russ Schetroma. But, it has evolved to have a highly important secondary function, and that is to provide a meeting place for some of the best lawyers in America. Look around; you are here.

It is here that we make acquaintances, know who the good lawyers and landmen are and often make lasting friendships. This is how I had the privilege of becoming a good friend with Russ Schetroma.

To offer a little snippet of that friendship: In 2002, I was preparing a lecture for my Coal, Oil and Gas course at the College of Law at West Virginia University. The topic was mineral ownership and I was curious whether Pennsylvania still adhered to the *Dunham* rule as modified in *Bundy* where the Pennsylvania Court held that oil and gas are not "minerals." So, I sent an email to Russ.

> The answer was pure Russ: "We still follow the *Dunham* rule with the *Bundy* qualification — it's a matter of intent of the parties, so you basically always have an ambiguity with the potential for parol [evidence].
>
> I had a wonderful old county case that I have not been able to locate the last several times I have wanted it, but have a better rule ("Russ Rule"): If an instrument is drawn by a lawyer "minerals" does not include oil or gas, because lawyers should know the *Dunham* rule; if an instrument is drawn by a non-lawyer, "minerals" does include oil and gas, because everybody but lawyers would assume that it did!"

How do I sum up all of this and say who Russ was and what he stood for? If I were to use Russ' own words as a dog lover, he would say, "I can only hope to have been as good a person as each of my canine friends thought I was."

Who Russ was is stated more poignantly in *what he did*. Russ was a philanthropist and his last testament created a permanent charitable endowment with the Crawford Heritage Community Foundation in Crawford, Pennsylvania.

He left the bulk of estate to this Foundation for the support in perpetuity of the Meadville Public Library, the Chautauqua Institution's Department of Religion and to the EMLF.

As to the EMLF, the funds are to be used to *provide travel and lodging assistance to law students seeking to attend the EMLF Annual Institutes*.

Think about that: To law students so that they can travel and attend this meeting. Stated more broadly, it will enable the youths who follow each of us to be introduced to the benefits of the highest quality education programs available, to the values of this Foundation and to the best lawyers and landmen in America who attend these meetings.

I am reminded of the poem, *The Bridge Builder*.* It is about an old man who must cross a chasm vast and deep and wide through which was flowing a sullen tide.

According to the poem, the old man crossed without fear. But, from the other side he built a bridge to span the tide.

The poem concludes with a query from a fellow pilgrim:

"Old man," said a fellow pilgrim, near,
"You are wasting strength with building here;
Your journey will end with the ending day;
You never again will pass this way;
You've crossed the chasm, deep and wide.
Why build you this bridge at the evening tide?"

"Good friend, in the path I have come," he said,
"There followeth after me today,
A youth, whose feet must pass this way.

This chasm, that has been naught to me,
To that fair-haired youth may a pitfall be.
He, too, must cross in the twilight dim;
Good friend, I am building this bridge for him."

In his final testament Russ challenged each of us: What bridges will we build for those young pilgrims who follow us?

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* *The Bridge Builder* was written by Will Allen Dromgoole, 1900.

Publications

"Eminent Domain: Just Compensation When the Condemnor Enters before Instituting Proceedings [comments]," 75 *Dick. L. Rev.* 303 (1970-1971).

"Employment Contracts — Enforcement of Restrictive Covenants against Competition after the Contract Time for Performance Has Expired — *Hayes v. Altman* [case]," 75 *Dick. L. Rev.* 651 (1970-1971).

"Pennsylvania Paramours: Seisin and the Other Woman" [comments], 76 *Dick. L. Rev.* 304 (1971-1972).

"Oil and Gas Royalties: Apportionment as Achieved by State Law, Contract, and Administrative Action," 7 *E. Min. L. Inst.* 13 (1986).

"The Mineral Interest — Royalty Distinction: An Eastern View and Update," 8 *E. Min. L. Inst.* 18 (1987).

"Real Estate Tax Sales and Mineral Titles: The Effects of Tax Sales under the Laws of Selected Eastern States Upon Oil, Gas, Mineral, and Related Real Property Interests," 11 *E. Min. L. Inst.* 5 (1990).

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"The Pennsylvania Statutory Oil & Gas Conservation Experience," No. 5 RMMLF-INST Paper No. 8C (2010).

"Spacing and Pooling Issues for Horizontal Development," No. 4 RMMLF-INST Paper No. 6 (2012).

"Horizontal Drilling in Appalachia: The Current State of Statutes, Regulations, and Cases," No. 4 RMMLF-INST Paper No. 6D (2012).

"Quiet Title Actions: Tools to Address Select Appalachian Title Defects," 34 *Energy & Min. L. Inst.* 15 (2013). [Additional authors: Nathaniel Holland, Robert Andre and Timothy M. McKeen].

Chapter 1

Unmanned Aircraft Operations in the Energy and Mining Industries: An Overview of the Legal and Regulatory Landscape

Eric J. Murdock
Hunton & Williams LLP
Washington, D.C.

Synopsis

§ 1.01. Introduction.

In recent years, the combination of improved capabilities and reduced cost has made the use of unmanned aircraft systems (UAS) an attractive technology for a wide range of commercial and industrial applications. Once the exclusive province of the military and hobbyists, UAS (commonly known as "drones") are now being used for motion picture and television filming and general aerial photography, surveying and mapping, monitoring and inspection of vertical and linear infrastructure, such as oil rigs and pipelines, and large scale landscapes such as surface mines and farm land. Some envision the use of UAS to deliver packages and pizza, and are actively pursuing research and development to that end.

Although the technology is readily available and increasingly inexpensive, the operation of UAS within the National Airspace System — which for UAS means pretty much anywhere out-of-doors — requires compliance with (or exemption from) Federal Aviation Administration (FAA) regulations and implicates a number of other legal considerations. As can be expected with the opening of any new technological frontier, a conflict has arisen between the goals of commerce and those of government. Businesses are looking to maximize the commercial uses of UAS and expedite innovation. Although federal, state and local governments share the interest in promoting economic growth, they are also responsible for ensuring national security and public safety and are increasingly under pressure to address concerns about individual privacy as well. This chapter will provide an overview of the developing legal and regulatory landscape for the use of unmanned aircraft in commercial applications in the United States, in particular in the energy and mining sectors.

§ 1.02. Unmanned Aircraft Systems.

Unmanned aircraft come in many shapes and sizes depending on their function. UAS used in military applications, such as the "Predator" drone, can be as large as manned aircraft and capable of carrying (and delivering) large payloads. At present, unmanned aircraft used in the commercial sector are typically much smaller, and are similar in size and appearance to the kinds of "model" aircraft used for recreational purposes and available for purchase at many hobby shops and retail electronic stores (although often employing substantially more sophisticated technology). As discussed below, for regulatory purposes, the FAA defines a "small" UAS as one that weighs less than 55 pounds.[1] This category covers most UAS currently used in commercial and industrial applications and accommodates the use of cameras or sensing equipment on the aircraft. This chapter will focus on the small UAS category.

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1 FAA Modernization and Reform Act of 2012, 49 U.S.C.A. § 40101 Sec. 331. Definitions (6).

Small UAS take one of two basic forms. Most common are "rotor craft" which operate much like a manned helicopter, with vertical take-off and landing and capability to hover in place and move in any direction in three-dimensional space. The least expensive rotor craft targeted to hobbyists typically use four rotors, but more sophisticated aircraft intended for serious commercial and industrial applications often use six or even eight rotors for increased reliability and operational capability even if one of the rotors should fail. Less common, but still appropriate for certain applications (such as extended flights along a linear corridor), are fixed wing unmanned aircraft. These are typically launched using a small catapult or even by hand, and land like a conventional manned fixed wing aircraft, albeit somewhat less gracefully.

Most small UAS operate using electric motors with on-board batteries (along at least one company is marketing a solar powered fixed wing aircraft). Payload limitations constrain the battery capacity which means that flying times are typically limited to no more than an hour or two. The aircraft are operated remotely by radio frequency using a ground-based command station (which may be simply a laptop computer or tablet). They can be operated manually much as a pilot would control a manned aircraft, but in most commercial applications operation is governed by pre-programmed GPS coordinates. More sophisticated systems include "homing" capability that directs the aircraft to a safe landing at a pre-determined location if the communication link to the command station is lost.

§ 1.03. UAS Applications for the Energy and Mining Sectors.

Unmanned aircraft are already being used for a variety of applications in the energy and mining industries. In general, UAS are well suited for tasks that are dirty, dull, or dangerous. Several large electric utility companies have obtained FAA approval to use UAS to inspect transmission line corridors and monitor conditions within linear rights-of-way on both a routine basis and in response to outages.[2] Oil and gas companies have obtained FAA

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2 As discussed *infra* at § 8.04 [2], at present, all commercial UAS operations must be approved by the FAA on a case-by-case basis. The FAA maintains a listing of all such

approval to use UAS to inspect flare stacks and monitor remote drilling and extraction operations. Several UAS operators have obtained FAA approval to inspect and survey surface mining operations. For these applications, UAS operations are generally safer, more efficient, and less expensive than the use of manned aircraft or other means. As the technology develops, and regulatory flexibility expands, many more commercial and industrial applications for UAS are likely to be found.

§ 1.04. FAA Regulation and Integration of UAS into the National Airspace System.

[1] — Background.

The Federal Aviation Act of 1958 established the FAA and charged the agency with responsibility for regulating the use of "navigable airspace" within the United States.[3] The FAA views its primary mission to be the safe and efficient of operation of aircraft — with safety always the top priority. To accomplish this mission, the FAA established the National Airspace System (NAS), which consists of both infrastructure — a network of air navigation facilities, air traffic control facilities, and airports — and operational rules and regulations. Known collectively as the Federal Aviation Regulations (or FARs), these rules govern, among other matters, the certification of aircraft, pilot qualifications, and aircraft operations.[4]

The FAA considers UAS to be "aircraft" subject to the FARs, and in 2007 the agency issued a notice stating that "no person may operate a UAS in the National Airspace System without specific authority."[5] The FAA's regulatory authority under the Federal Aviation Act applies to "the navigable airspace," which is defined as "the minimum altitudes of flight prescribed by regulations" issued pursuant to the statute.[6] The FARs specify certain

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authorizations, and provides access to the authorization documents, at the following web site: http://www.faa.gov/uas/legislative_programs/section_333/333_authorizations/.

3 49 U.S.C. §40103(b).

4 14 C.F.R. Parts 1-199.

5 Federal Aviation Administration, "Unmanned Aircraft Operations in the National Airspace System," 72 Fed. Reg. 6689-6690 (Feb. 13, 2007).

6 49 U.S.C. §40102(a)(32). The FAA thus has discretion to set the geographic limits of its own regulatory authority.

minimum altitudes for aircraft operations — for example, 500 feet above the ground surface in uncongested areas (except as necessary for takeoff or landing).[7] Arguably, in such areas (and away from airports) the space below 500 feet — where many UAS operations occur — is not within the "navigable" airspace, and thus not subject to the FAA's statutory jurisdiction. The FAA plainly takes a different view, however, at least with respect to UAS, having recently pursued a successful enforcement action against a UAS operator for allegedly reckless operations as low as 10 feet above the ground.[8] As a practical matter, therefore, anyone operating a UAS anywhere out-of-doors should expect to comply with the FARs.[9]

Unfortunately, the FARs were developed in the context of manned aircraft and in certain respects do not translate well to UAS. A core principle under the FARs is the requirement that "vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft."[10] Given the absence of an on-board pilot, however, UAS cannot be presumed to be capable of meeting this requirement. Similarly, the lack of on-board pilot and communications capabilities means UAS cannot receive and respond to instructions from air traffic control operators. In addition, the physical constraints of small UAS preclude compliance with some requirements under the FARs, such as the requirement to maintain documentation on board the aircraft. As a consequence, other than for strictly recreational purposes, UAS cannot be operated legally in the navigable airspace of the United States without specific authorization from the FAA providing relief from the provisions of the FARs that cannot be met.

It has been recognized for years that this situation presents a significant obstacle to realizing the substantial benefits from the commercial use of

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7 14 C.F.R. §91.119(c).

8 *See* Huerta v. Pirker, NTSB Order No. EA-5730, Docket CP-217 (2014).

9 The term "National Airspace System" refers to the FAA's "system" for regulating aircraft operations, and does not define a geographic space. The only term defined by statute or regulation delineating the geographic scope of FAA jurisdiction for aircraft operations, and thus the real-world space within which the National Airspace System functions, is "navigable airspace."

10 14 C.F.R. §91.113(b).

UAS technology. Congress sought to address this problem in the Federal Aviation Administration Modernization and Reform Act ("FMRA") of 2012 by tasking the Secretary of Transportation with developing a comprehensive plan for the full integration of UAS into the National Airspace System by September 30, 2015.[11] Although the FAA is behind schedule to meet that deadline, it has been making progress. It created the Unmanned Aircraft Systems Integration Office and in 2013 issued a "road map" outlining the plan to move from the initial accommodation of UAS on a limited basis to full integration into the NAS. In the fall of 2014, the FAA issued the first "exemption" pursuant to Section 333 of the FMRA authorizing the use of UAS on a case-by-case basis. On February 23, 2015, the FAA published a notice of proposed rulemaking to establish a new regulatory program that would generally authorize the operation of small UAS under certain conditions. These latter two developments are discussed further in the next sections.

[2] — Section 333 Exemptions.

Section 333(a) of the FMRA directs the Secretary of Transportation (acting through the FAA) to "determine if certain unmanned aircraft systems may operate safely in the national airspace before completion of the plan and rulemaking required by section 332 of this Act."[12] Relying on this authority, the FAA has established an "exemption" process for granting individual authorizations for the operation of UAS on a case-by-case basis as an interim measure until the FAA promulgates regulations providing for the general operation of UAS in the National Airspace System.[13]

There are three elements to the exemption process. First, where warranted by the specific circumstances, the FAA relies on express authority under Section 333(b) of the FMRA to waive the requirement for an airworthiness

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11 FMRA, § 332(a), Pub. Law 11-95 (Feb. 14, 2012).

12 FMRA § 333(a).

13 *See* FAA Home – Unmanned Aircraft Systems – Key Initiatives – Section 333; http://www.faa.gov/uas/legislative_programs/section_333/.

certification for a particular model of UAS.[14] This eliminates the need for a detailed evaluation of the aircraft by the FAA to determine that it has the necessary capabilities to operate safely in the National Airspace System, a process that typically takes several years. Second, the FAA relies on existing statutory and regulatory authority to grant exemption from specific FARs upon a finding that such exemption is in the public interest.[15] Finally, the petitioner must obtain a Certificate of Waiver or Authorization ("COA") from the local FAA Air Traffic Organization for the specific UAS operation in the National Airspace System.

A petition to the FAA for exemption from the FARs must (i) identify the specific sections of the FARs from which exemption is sought, (ii) describe the extent of and reason for the relief sought, (iii) explain how granting the exemption would benefit the public as a whole (*i.e.*, why it is in the public interest), and (iv) explain how an equivalent or greater level of safety will be achieved by the grant of the exemption.[16] In practice, Section 333 exemption petitions for UAS operations typically include information about the specific aircraft, including technical specifications and user manuals, and describe the specific purpose and geographic locations of the proposed UAS operations. The petition also typically includes some kind of flight operating protocol

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14 FMRA § 333(b) (requiring the Secretary to determine "which types of unmanned aircraft systems, if any, as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security," as well as whether an airworthiness certification is required for any such unmanned aircraft systems).

15 The FAA Administrator is authorized by several statutory provisions to issue exemptions from the FARs in appropriate circumstances. For example, the Administrator "may grant an exemption from a regulation prescribed in carrying out sections 40103(b)(1) and (2), 40119, 44901, 44903, 44906, and 44935-44937 of this title when the Administrator decides the exemption is in the public interest." 49 U.S.C. § 40109(b). Likewise, the Administrator "may grant an exemption from a requirement of a regulation prescribed under subsection (a) or (b) of this section or any of sections 44702-44716 of this title if the Administrator finds the exemption is in the public interest." 49 U.S.C. § 44701(f). Pursuant to these statutory authorities, the FAA regulations allow a party to request relief from the FARs by submitting a petition for exemption to the FAA. 14 C.F.R. § 11.61.

16 14 C.F.R. § 11.81.

that outlines operator qualifications, pre-and post-flight safety check and maintenance procedures, and in-flight operating parameters and limitations as a basis for demonstrating that the proposed operations will provide for at least an equivalent level of safety as would be achieved through compliance with the requirements from which relief is sought.

The FAA granted the first Section 333 exemptions in September and October of 2014 authorizing the operation of UAS for closed-set motion picture and television filming. Over the next several months, the FAA issued additional exemptions for aerial surveying and photography, flare stack inspections, agricultural analysis, aerial monitoring of controlled access oil and gas facilities, and bridge inspections, among other uses. All of these exemptions, which are valid for two years, include the same general terms, conditions and limitations. The exemption only authorizes the use the specific aircraft identified in the petition. The initial exemptions limited the UAS operations to the specific purpose described in the petition. More recent exemptions, for which the FAA has developed a more or less standard list of conditions, do not expressly limit the purpose for which the UAS operation is authorized, although the exemption document elsewhere notes the specific purpose described in the petition. For these more recent exemptions, it is unclear whether the UAS operation is strictly limited that the petitioner's stated purpose or whether other uses are authorized as long as they comply with all of the specified operational limitations.

The operational limitations are largely the same for each exemption, regardless of the aircraft to be used or the specific purpose of the operations. The primary requirement, which is intended to satisfy the "see and avoid" requirement, is the use of both an operator and a visual observer each of whom must have a visual line of sight to the UAS at all times. Other standard operational conditions and limitations include: (i) a maximum speed of 87 knots (100 miles per hour), (ii) a maximum altitude of 400 feet above ground level, (iii) operations only during daylight hours and under conditions of good visibility, (iv) no operations within 5 miles of an airport without written permission from the airport operator, (v) no operations within 500 feet of any nonparticipating persons, vessels, vehicles or structures (subject to certain exceptions where adequate safety measures are taken), and (vi) all

operations must be conducted over private or controlled-access property with permission from the property owner. In addition, the operator must hold at least a private, recreational, or sport pilot's license from the FAA.

Through mid-March of 2015, the FAA had granted 37 individual exemptions. These first exemptions prompted a wave of additional applications and a backlog quickly developed. To address this problem, in early April the FAA began to use what it described as a "summary grant" process to streamline its review of Section 333 exemption petitions. Under this process, the FAA issues exemptions based on the analysis conducted for exemptions previously granted for essentially the same kind of operations using the same or similar aircraft. Employing this new process, the FAA has significantly accelerated pace of its review. As of June 30, 2015, nearly 700 exemptions had been granted, although hundreds more remain in the queue as the early approvals have sparked interest from other prospective users of UAS for commercial purposes. In a further effort to expedite the use of UAS, the FAA announced in late March of 2015 that it would begin issuing a "blanket" COA with each Section 333 exemption that would authorize the operation of UAS below 200 feet and beyond certain minimum distances from airports, thus eliminating the need to obtain an individual COA for UAS operations occurring within these geographic limits, which likely accommodate the majority of such operations as presently authorized under Section 333 exemptions.

[3] — Proposed Rule to Authorize the Operation of Small UAS.

On February 23, 2015, the FAA published a notice of proposed rulemaking concerning the operation of small UAS.[17] The proposed rule would create a new regulatory program within the FARs applicable to UAS weighing less than 55 pounds. Under the rule, the operation of such aircraft would be generally authorized subject to certain standard limitations similar, but not identical, to the limitations typically imposed in connection with

17 80 Fed. Reg. 9544 (Feb. 23, 2015).

Section 333 exemptions. These conditions and limitation include: (i) visual line of sight operations only (but no requirement for a visual observer), (ii) no flight over any persons not directly involved in the operation, (iii) operations only during daylight hours and visibility of at least three miles from the control station, (iv) maximum speed of 87 knots (100 miles per hour); (v) maximum altitude of 500 feet above ground level; (vi) operations allowed in Glass G airspace without need for COA from local Air Traffic Organization. The proposed rule would not require an airworthiness certification for small UAS, and would not require the operator to have a pilot's license, but would require an unmanned aircraft operator certificate with a small UAS rating to be issued under a new certification program.

In its proposal, the FAA requested public comment on a variety of topics, and approximately 4500 comments were submitted by the time the comment period closed on April 24, 2015. The FAA is under no legally imposed deadline to take action on the proposed rule. However, an agency official recently advised a House panel that the small UAS rule is expected to be finalized by June of 2016.[18]

If the rule is issued as proposed, it would likely accommodate a wide range of potential applications in the energy and mining sectors. Nonetheless, as outlined below, some of the proposed limitations could significantly constrain such applications.

[a] — Visual Line of Sight Limitations.

The proposed rule would impose fairly strict "visual line of sight" (VLOS) limitations. Although the proposal would not require the UAS operator to maintain actual visual contact with the aircraft at all times, the operator must be "capable" of visual contact with the UAS at all times, even if a visual observer is used. Although the FAA is aware of the advancements in "first person view" technology by which the operator would view images

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18 Testimony of Michael Whitaker, FAA Deputy Administrator, Hearing, "Drones: The Next Generation of Commerce?" before U.S. House of Representatives Committee on Oversight and Government Reform, June 17, 2015.

from a camera mounted on the UAS,[19] it believes this technology is not sufficiently advanced to satisfy the "see-and-avoid" requirement that is "at the heart of the FAA's regulatory structure mitigating the risk of aircraft colliding in midair."[20] The VLOS requirement substantially limits the distances that can be covered by UAS operations during a given flight.

[b] — No Operations from a Moving Aircraft or Land-Borne Vehicle.

The proposed rule would prohibit the operation of UAS from a moving aircraft or land-based vehicle.[21] This reflects the FAA's approach for mitigating the risk of loss of positive control over the aircraft by constraining the lateral extent of UAS operations. As with the VLOS requirement described above, this restriction by design limits substantially the distances that can be covered by UAS operations during a given flight. For a linear facility, such as a pipeline, the operation of UAS from a vehicle traveling within the right-of-way corridor could greatly enhance the efficiency of the operation, with seemingly little if any adverse effect on the safety of the operation. In its proposal, the FAA acknowledged that it "is considering alternatives for regulation of the operation of small UAS from moving land vehicles, while protecting safety"[22] and specifically invited comments on a regulatory framework for such operations.

[c] — Daytime Operations Only.

In line with the standard limitations specified for Section 333 exemptions, the proposed rule would limit UAS operations to daylight hours (official sunrise to sunset hours, local time). This restriction is intended to ensure

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19 "First person view" refers to real-time video images of the surrounding airspace from on-board cameras that provide a perspective similar to that of an on-board pilot.

20 80 Fed. Reg. at 9560.

21 Unlike the Section 333 exemption grants to date, the proposed small UAS rule would permit the operation of the UAS from a water-borne vehicle based on the rationale that a loss of positive control of an aircraft over water would be less likely to injure a person or property.

22 80 Fed. Reg. 9544, 9562 (Feb. 23, 2015).

the visibility of the aircraft, the surrounding airspace, and even people on the ground. While noting that existing federal aviation regulations impose extensive lighting requirements on manned aircraft operations (that could be quite cumbersome for UAS), the FAA invited comments on how to mitigate the risk of UAS operations during low-light or nighttime operations.

§ 1.05. Privacy Considerations.

The rapidly expanding use of UAS by hobbyists, businesses, and government agencies has raised concerns about the use (or misuse) of the technology in a way that threatens personal privacy interests.[23] No one welcomes the prospect of a camera-equipped drone hovering outside a bedroom window, although existing "peeping Tom" prohibitions presumably would apply to such an activity. UAS technology also provides new perspectives that implicate novel privacy considerations. For example, outdoor activities behind a backyard wall or fence that are generally shielded from public view by someone observing from the ground can be brought into plain view by means of a drone operating 100 feet above a neighboring property. As discussed Section 1.06 below, a number of states have enacted or are considering new laws to address this circumstance by restricting or prohibiting the use of UAS to capture images of third parties without their consent.

The FAA has taken a neutral stand, imposing no standards or limitations related to privacy in either its proposed small UAS rule or in setting the terms and conditions for Section 333 exemptions.[24] However, another federal agency has been charged with the task of coordinating efforts between various public and private stakeholders to develop privacy standards for commercial UAS use. On March 4, 2015, in response to a directive from the President, the U.S. Department of Commerce's National Telecommunications and

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[23] As used here, "privacy" refers to the interest of an individual in avoiding observation by others when engaging in conduct for which such individual has a reasonable expectation of privacy, as well as avoiding the recording and dissemination of images of identifiable persons engaging in such private conduct.

[24] The FAA expressly stated that privacy issues were "beyond the scope" of its small UAS proposed rulemaking. 80 Fed. Reg. at 9552.

Information Administration (NTIA) announced a multi-stakeholder process seeking comments on best practices concerning privacy, transparency, and accountability issues related to commercial and private use of UAS. As part of this process. NTIA plans to convene a series of public meetings following the initial round of comments, which were due by April 20, 2015. Where this process will lead remains to be seen. One possibility is the development of set of general standards that businesses can adopt as part of their own privacy policies for UAS operations. In light of the many new state laws designed to protect against invasion of privacy by means of UAS, commercial UAS operators would be well advised to adopt policies making clear that they do not use the technology to observe or record identifiable persons not involved in the operation.

In addition, recently filed litigation seeks to compel the FAA to weigh in on privacy issue despite its desire to remain neutral. On March 31, 2015, the Electronic Privacy Information Center (EPIC) filed a petition with the U.S. Court of Appeals for the D.C. Circuit alleging that the FAA unlawfully failed to address privacy in its proposed rule for small UAS, and challenging the FAA's denial of EPIC's petition requesting the agency to issue rules to protect against threats to privacy and civil liberties from the operation of UAS in the United States.[25] This litigation is still in the early stages, and the outcome remains to be seen.

§ 1.06. State and Local Laws and Regulations.

Over the past couple of years, prompted primarily by privacy concerns, many states have enacted or are actively considering legislation to regulate the use of UAS. Much of this legislation is focused on the use of UAS for surveillance by state and local law enforcement agencies, and involve restrictions on the collection and retention of surveillance data, but in many cases the prohibitions also apply to private or commercial UAS operations. For example, in April of 2015, the state of Florida enacted legislation that prohibits *any person* (in addition to any state agency or political subdivision)

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25 Electronic Privacy Information Center v. FAA, No. 15-1075 (D.C. Cir. Mar. 31. 2015).

from using UAS to capture images of private real property or individuals on such property under circumstances where a reasonable expectation of privacy exists without written consent from the affected parties.[26] The law creates a presumption that a person has a reasonable expectation of privacy on any private property which cannot be seen by persons located at ground level from a place where they have a legal right to be, and creates a private right of action for compensatory and punitive damages for a violation of the prohibition.[27] The bill also creates an exception to this prohibition for the use of UAS by an electric, water, or natural gas utility for operation and maintenance of utility facilities.[28]

Some state laws governing UAS operations go beyond prohibitions against unauthorized surveillance. For example, in 2014, North Carolina enacted a law that requires any person operating UAS for commercial purposes to obtain a license from the Division of Aviation of the state Department of Transportation.[29] This is in addition to the pilot licensing requirements imposed by the FAA. At the state level, the legal landscape regarding the operation of UAS likely will continue to change over the next few years, and businesses operating UAS will need to pay close attention to state and local legal requirements to ensure that such operations fully comply with the law.[30]

§ 1.07. Property Rights.

Because UAS are typically operated at altitudes much lower than manned aircraft, the integration of UAS into the National Airspace System likely will result in new legal conflicts between the rights of property owners and the

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26 Enacted as Senate Bill 766, the law amends the "Freedom from Unwarranted Surveillance Act" codified at § 934.50 of the Florida Statutes.

27 Fla. Stat. § 934.50(3)(b),(5) (2015).

28 Fla. Stat. § 934.50(4)(f) (2015).

29 House Bill 1099 (amending Chapter 15A of the North Carolina General Statutes to add a new Article 16B, "Use of Unmanned Aircraft Systems").

30 There are a number of web sites that track state UAS laws. For example, the National Conference of State Legislatures maintains such a site at http://www.ncsl.org/research/civil-and-criminal-justice/2014-state-unmanned-aircraft-systems-uas-legislation.aspx.

rights of persons operating UAS for otherwise lawful purposes. A central question is whether, and to what extent, a property owner has a legal right to prohibit UAS from flying over his property. As noted above, commercial UAS operations authorized by a Section 333 exemption require the property owner's permission. The proposed small UAS rule, however, imposes no such requirement and would generally authorize the operation of UAS in any airspace not subject to air traffic control (Glass G airspace). The rule also would confirm that the "navigable airspace," at least for UAS, extends to altitudes below 500 feet, where conflicts between UAS operations and the use and enjoyment of the underlying land are most likely to arise. This section outlines the issues and discusses some of the competing legal claims with which courts and legislatures will have to contend.

English common law provided the legal background for the American concept of airspace rights through the writings of such authors as Edward Coke and William Blackstone. Perhaps the most famous maxim of English law that was carried through to modern times is "*cujus est solum, ejus est usque ad coelum*" (whoever has the land possesses all the space upwards to an indefinite extent).[31] This rule remained an important concept of property law until the invention of the airplane and the birth of the aviation industry.

Early cases in American history dealt with airspace rights in close proximity to the ground, such as who owned the fruit falling from overhanging tree branches[32] and whether a landowner could enjoin the stringing of telephone lines over his property.[33] Landowners often prevailed, but even in the case of pears falling from overhanging tree branches onto another person's property, the court held that the landowner was only entitled to remove the branches, not to convert the branches or fruit to his own use.[34] Eventually, technological advancements would force the courts to define

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31 Robert R. Wright, *The Law of Airspace*, 7 (1968).

32 *See* Lyman v. Hale, 11 Conn. 177 (1836) (finding that a landowner was entitled to remove overhanging branches on his property but was not entitled to keep the fruit from the branches since he did not own it).

33 *See* Butler v. Frontier Telephone Co., 109 App Div 217, 95 NYS 684 (1905) (allowing a landowner to eject telephone lines strung above his property).

34 *Lyman*, 11 Conn. at 184.

the limits of airspace rights more precisely and balance the interests of landowners against the claims of aviation. Several theories of airspace rights have been advanced at different times and places throughout U.S. history, including the following: absolute ownership of all airspace above the land, ownership of airspace subject to a public privilege of flight, ownership up to a fixed height, ownership up to the landowner's ability to take effective possession, and no ownership except for the space that the landowner actually occupies.[35]

The U.S. Supreme Court eventually set an important precedent regarding airspace rights in *U.S. v. Causby*,[36] a case involving U.S. military flights over a chicken farm located near a municipal airport. The landowner claimed that flights at altitudes as low as 83 feet above ground by large and loud military aircraft amounted to a taking of his property because the flights disrupted his daily activities, frightened his animals, and eventually forced him to shut down the chicken farm.[37] The Court held that the common law doctrine that a property owner holds rights to an infinite extent in the airspace above his property "has no place in modern world," but nonetheless concluded that the landowner had a property interest in "at least as much of the space above the ground as he can occupy or use in connection with the land" and had a right to "exclusive control of the immediate reaches of the enveloping atmosphere."[38] Applying that standard, the Court ruled that flights at altitudes so low as to prevent the landowner from continuing to use the property to raise chickens was an invasion of the landowner's property rights.

In reaching this decision, the Court considered the competing interest of the public in air navigation. At that time, "navigable airspace" was defined by statute as "airspace above the minimum safe altitudes of flight prescribed by the Civil Aeronautics Authority," and the minimum safe altitude during daylight hours was set by regulation at 500 feet.[39] In the Court's view, the

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35 Wright, *supra* at 145.
36 U.S. v. Causby, 328 U.S. 256 (1946).
37 *Id*. at 259.
38 *Id*. at 264.
39 *Id*. at 260.

public aviation easement established by federal law did not extend below the designated 500-foot minimum altitude for safe flight, and thus the take-off and landing operations at issue were deemed to occur outside of the "navigable airspace." The Court thus avoided the need to resolve any conflict between the landowner's rights to the airspace above his property and the navigable airspace that Congress had placed within the public domain.

Under the current FAA regulations, the minimum safe altitude for air navigation is 500 feet above the ground, which presumably defines the floor for the navigable airspace. Most UAS operations take place in the very airspace that is not typically used for navigation by manned aircraft, and thus not traditionally considered part of the navigable airspace, at least as interpreted by the Supreme Court in *Causby*. As noted above, however, the FAA has asserted regulatory jurisdiction for UAS below 500 feet, raising a question about what currently constitutes navigable airspace. Moreover, if the small UAS rule is issued as proposed, then the minimum safe altitude defined by regulation, and thus the "navigable airspace," would extend all the way to the ground, at least for UAS. In that event, the public right of transit through the navigable airspace established by federal statute would appear to authorize the use of UAS over any property at any altitude, regardless of the property owner's objection.[40]

Against this background, it is uncertain whether a landowner would be able to maintain an action for trespass against a person who operates a drone

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40 This issue is illustrated by a current legislative effort in California to define the circumstance when the flight of an unmanned aircraft over private property may be considered a trespass. As originally drafted, the bill in question (SB 142) targeted flights below the "navigable airspace" as defined by federal law. A law professor at Pepperdine University, Gregory McNeal, commenting on the proposal, pointed out that, at least for UAS, the FAA considers the navigable airspace to extend down to the ground surface, in which case the proposed law would not achieve its objective. *See* Http://www.forbes.com/sites/gregorymcneal/2015/02/16/californias-drone-trespass-bill-is-great-except-for-one-fatal-flaw/. At Professor McNeal's suggestion, the bill was subsequently amended to draw the line for trespass at 350 feet above the ground, so as to leave room for UAS overflights in the space between 350 and 500 feet. The amended bill was passed by the California Senate on May 5, 2015, and was referred to the California State Assembly for consideration. Even if this bill is eventually enacted into law, a question remains whether it would be preempted by federal law purporting to define "navigable airspace" for UAS all the way to the ground.

over his property without his permission. An alternative approach that may avoid some of these unsettled property rights questions would be a claim for nuisance to prevent incursions into the space above private land. A nuisance claim typically requires the landowner to demonstrate some interference with the use and enjoyment of the land, but does not require a claim of property right to the airspace in which the UAS operates. Common factors in airspace nuisance claims involve excessive noise, dust, smoke, health issues, fear of injury, diminution in property value, and the loss of the use of the premises for certain purposes.[41] As a practical matter, however, the ability to prosecute a nuisance abatement suit could be hampered by the difficulty in identifying the offending UAS operator.

There may also be some self-help measures available to property owners concerned about unauthorized UAS operations over their land. Various UAS "counter-technologies" are beginning to appear in the marketplace, including drone detection via acoustics, electronic signal detection and disruption, and even devices for physical UAS interdiction (although it is worth noting that if a UAS is considered "aircraft" by the FAA then it could be a federal crime to attack or destroy one). Some counter-technologies concentrate on detecting a UAS, either by perceiving the sound the UAS makes during flight or sensing the electronic signals that are sent to and from the UAS. For example, one company claims that its equipment can detect the radio frequencies and GPS signals used for UAS operations.[42] These electronic signals could be detected and possibly disrupted under certain circumstances, but jamming devices in the United States are strictly controlled and typically limited only to government use. Another company has designed a product that detects wireless surveillance devices, such as a UAS-mounted camera or sensor that is attempting to use the landowner's wireless network to stream data to another location, and prevents them from connecting to the landowner's network.[43] This at least prevents surveillance data from being streamed to the trespassing party over the landowner's own network. Possible methods

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41 Wright, *supra* at 158.

42 Drone Detector, http://www.dronedetector.com/.

43 Cyborg Unplug, https://plugunplug.net/.

of physical UAS interdiction include everything from UAS interceptors that drop a tangle line into the rotors of the offending UAS,[44] to falcons,[45] to shotguns.[46]

As a body of law develops around the use of drones and landowners resort to various self-help methods, physical countermeasures may become more commonplace and legally authorized in certain situations. The issue may come down to whether the courts view unwanted UAS in a landowner's airspace more like an overhanging tree branch that can be cut off or an aircraft flying at the FAA approved altitude within a public right of way.

§ 1.08. Conclusion.

Unmanned aircraft systems are already being used by energy and mining companies for tasks such as inspection, monitoring, and surveying of remote facilities and hard-to-access infrastructure. In these applications, UAS are generally safer, more effective, and less expensive than manned aircraft or other means for accomplishing such tasks. The technology is evolving rapidly, expanding the capabilities while at the same time bringing down costs. It is reasonable to expect that UAS could become commonly employed for a wide range of applications in the energy and mining industries — in particular, tasks that are dirty, dull, or dangerous. At the same time, the operation of UAS for commercial purposes raise a number of legal considerations, from FAA regulation, to state laws protecting privacy interests and property rights, to potential liability for property damage or personal injury. Companies wishing to take advantage of the benefits of UAS technology also should pay close attention the legal and regulatory landscape as it continues to evolve along with the technology.

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44 *Popular Science*, (Jan. 16, 2015), "Rapere is an Anti-Drone Interceptor," http://www.popsci.com/rapere-anti-drone-interceptor.

45 *Popular Science*, (Dec. 5, 2014), "Can Birds Be Trained To Bring Down Drones?," http://www.popsci.com/can-birds-be-trained-attack-drones.

46 *Popular Science*, (Sept. 30, 2014), "New Jersey Man Accused of Shooting Down Neighbor's Remote Control Drone," http://philadelphia.cbslocal.com/2014/09/30/new-jersey-man-accused-of-shooting-down-neighbors-remote-control-drone/