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The Final Frontier: Creditors' Recovery of Assets in Outer Space

We are amid a new Space Race 2.0. Many space-faring nations, including the U.S. and China, are now in a not-so-veiled competition to establish viable long-term bases, operations and human settlements on the Moon and other celestial bodies. Venturing into outer space is no longer only an exploratory and scientific pursuit. Space is now commercialized, and tourism has commenced. Mining in space to obtain rare-earth minerals on asteroids and the valuable resources on the Moon is on the horizon.

More than 11,000 satellites are functioning above Earth in low Earth orbit. These satellites are used for myriad purposes, including Earth observation, global-positioning systems, taking images/photographs of various places on Earth and internet service. Soon, autonomous robots and machinery and other artificial intelligence will construct buildings on other planets. Products manufactured in outer space will be imported to Earth for use.² This new space economy is rapidly evolving, robust and growing. The global space economy is expected to be worth approximately \$1.8 trillion by 2035.³

Lenders and other investors provide the necessary funding for capital-intensive activities in outer space. Accordingly, they take security interests in the assets in outer space that the borrower owns or will own. These assets include satellites, equipment, machinery and valuable minerals.

The post-default exercise of creditor remedies with respect to assets in outer space is an untested

area. This article delves into applicable space law, secured transactions law, bankruptcy law and legal considerations related to creditors' remote or autonomous disablement, and/or repossession of an asset in outer space through the use of technology, including robotic arms, after a debtor's default.

Property Ownership Interests in Assets in Outer Space

Current law allows private parties to own assets in outer space, but governmental entities are prohibited from appropriating and exercising sovereignty over outer space.

Sovereign Appropriation of Property in Space Is Not Allowed

By becoming a party to the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (hereinafter, the "Outer Space Treaty"), the U.S. agreed that it and all other state parties bound by the treaty may not engage in national appropriation of outer space "by claim of sovereignty, by means of use or occupation, or by any other means."⁴ Further, to promote international cooperation instead of conflict regarding activities in space, on Oct. 13, 2020, the U.S. launched the Artemis Accords, a nonbinding set of principles designed to facilitate civil space exploration.⁵

To ensure lawful extraction and utilization of space resources, § 10 of the Artemis Accords



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¹ This article represents the views of the author, and such views should not necessarily be imputed to Simmons Legal PLLC or its respective affiliates and clients.

² See, e.g., Brett Tingley, "Varda Space's Private In-Space Manufacturing Capsule's Historic Return to Earth in Photos," *Space* (Feb. 23, 2024), available at space.com/varda-in-space-manufacturing-capsule-reentry-photos (unless otherwise specified, all links in this article were last visited on Aug. 20, 2024).

³ "Space: The \$1.8 Trillion Opportunity for Global Economic Growth," McKinsey & Company (April 8, 2024), available at mckinsey.com/industries/aerospace-and-defense/our-insights/space-the-1-point-8-trillion-dollar-opportunity-for-global-economic-growth.

⁴ See Outer Space Treaty, Art. II, available at treaties.un.org/doc/Publication/UNTS/Volume%20610/volume-610-I-8843-English.pdf.

⁵ See "The Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes," Nat'l Aeronautics and Space Admin. (Oct. 13, 2020), available at nasa.gov/wp-content/uploads/2022/11/Artemis-Accords-signed-130ct2020.pdf?emrc=653a00.

provides “that the extraction of space resources does not inherently constitute national appropriation under Article II of the Outer Space Treaty, and that contracts and other legal instruments relating to space resources should be consistent with that Treaty.”⁶ The phrase “space resources” is left undefined in the Accords, but is defined under the U.S. law granting private parties the right to own space resources.

Private Ownership of Space Resources Is Authorized

Since the Outer Space Treaty does not specifically preclude private individuals and entities from owning outer space and its resources, in November 2015 the U.S. enacted the U.S. Commercial Space Launch Competitiveness Act (hereinafter, the “Space Act”).⁷ The Space Act grants private U.S. citizens, and not the U.S. government itself, the right to “possess, own, transport, use, and sell” an asteroid resource⁸ or other space resource that U.S. citizens obtain when engaging in commercial recovery of space resources.⁹ Luxembourg, the United Arab Emirates, Japan and India have similarly enacted laws and/or established policies regarding the ownership of space resources.¹⁰

Retention of Ownership of Assets Launched from Earth into Space

With respect to resources that are not in outer space, but are launched from Earth into space, parties retain ownership of those resources and objects.¹¹ Moreover, the state party that launches or procures the launching of an object into outer space is liable to other state parties for damage caused by the object.¹²

Outer Space Assets that Become Property of the Debtor’s Bankruptcy Estate

Section 541(a)(1) of the Bankruptcy Code provides that, in general and with few exceptions, all legal or equitable interests that the debtor holds in property as of the commencement of the bankruptcy case become property of the estate.¹³ Therefore, any interest the debtor has in space resources and other assets in outer space will likely be deemed property of the estate, and bankruptcy courts will have jurisdiction over those assets of the debtor.¹⁴

6 See *id.* § 10.

7 51 U.S.C. §§ 51301-51303.

8 51 U.S.C. §§ 51301(1) (defining phrase “asteroid resource” to mean “a space resource found on or within a single asteroid”); 51301(2)(A), (B) (defining “space resource” as “an abiotic resource in *situ* in outer space” and “water and minerals” as space resources).

9 51 U.S.C. § 51303. The phrase “commercial recovery” is not defined in the Space Act, so there are differing interpretations regarding whether private U.S. citizens can only own what they extract or can also own unextracted resources still in place.

10 See “Law of July 20th 2017 on the Exploration and Use of Space Resources, Luxembourg Space Agency,” Luxembourg Space Agency, *available at* space-agency.public.lu/en/agency/legal-framework/law_space_resources_english_translation.html; “On the Regulation of the Space Sector, ch. 3, art. 18” (Fed. L. No. 12), Dec. 12, 2019 (United Arab Emirates); “Japan: Space Resources Act Enacted,” U.S. Library of Cong., *available at* www.loc.gov/item/global-legal-monitor/2021-09-15/japan-space-resources-act-enacted; “Indian Space Policy” (2023), *available at* www.isro.gov.in/media_isro/pdf/IndianSpacePolicy2023.pdf.

11 See Outer Space Treaty, Art. VIII.

12 See *id.* at Article VII.

13 See 11 U.S.C. § 541(a)(1).

14 Like oil and gas exploration and production on Earth, Congress may need to address what becomes property of the bankruptcy estate when considering arrangements regarding the mining of resources in outer space. See Camisha L. Simmons, “Space Exploration and Production: Bankruptcy Perspectives,” XXXIX *ABI Journal* 10, 24-25, 60, October 2020, *available at* abi.org/abi-journal.

Technology-Enabled Exercise of Creditor Remedies in the Event of Default

Remote Disablement

Historically, after a borrower had defaulted on a loan, a creditor would take physical possession of easily movable assets serving as collateral. Existing technology now enables creditors, without physical contact, to remotely render a motor vehicle or equipment inoperable after nonpayment by the borrower. This occurs through installment of an electronic or digital device or system on the motor vehicle or equipment. The device or system either requires periodic entry of a code to continue operation of the vehicle or equipment, or allows the creditor to remotely disable operation of the vehicle or equipment.

Automated or Autonomous Repossession

Car manufacturer Ford filed a patent for a system that enables a car to repossess itself by driving itself back to the showroom.¹⁵ Similarly, we will soon have autonomous self-driving spacecraft and other vehicles and equipment in outer space. Creditors with security interests in the assets will enable automated and autonomous repossession of assets in outer space following an event of default. The asset will autonomously, or by remote control by the creditor, drive itself back to Earth or a designated location in outer space.

Secured creditors will also use remote controlled or autonomous “repo” machines or robots to repossess their collateral in the event of default. China has tested a robotic arm and demonstrated that it could successfully grasp and maneuver a spacecraft.¹⁶ It also has been reported that the “Chinese have tested [a] robotic arm and demonstrated [that] it can move a defunct satellite in and out of geosynchronous ... orbit.”¹⁷ A company with offices in Japan and the U.K. is working on using autonomous-navigation software and a robotic arm to remove defunct satellites that are in orbit.¹⁸

Repossession and Disablement Rights Under the UCC

Article 9 of the Uniform Commercial Code (UCC) governs secured transactions. Most space assets susceptible to remote disablement or automated or autonomous repossession are considered “goods” under the UCC.¹⁹ Moreover, the UCC further classifies those assets in outer space that are “goods other than inventory, farm products or consumer goods” as “equipment.”

The UCC provides secured creditors with two self-help remedies in the event of default.²⁰ It authorizes creditors with

15 See U.S. Patent Application No. 17/408,004, Publication No. US 2023/0055958 A1 (published Feb. 23, 2023) (Ford Global Technologies LLC, applicant).

16 See Andrew Jones, “On China’s New Space station, a Robotic Arm Test Paves Way for Future Construction,” *Space* (Jan. 11, 2022), *available at* space.com/china-space-station-robotic-arm-construction-test. China has also tested ways to disable and destroy satellites.

17 See Courtney Kube & Dan De Luce, “How China Is Challenging the U.S. Military’s Dominance in Space,” *NBC News* (Dec. 12, 2023), *available at* nbcnews.com/politics/national-security/china-challenging-us-militarys-dominance-space-rcna128993.

18 See Tereza Pultarova, “Astroscale Aims to Capture Old Space Junk with Robotic Arm in 2026,” *Space* (Aug. 8, 2023), *available at* space.com/astroscale-space-junk-removal-2026-plan-exclusive-video.

19 See U.C.C. § 9-102(a)(44) (defining “goods” as “all things movable when a security interest attaches”).

20 State law may limit the self-help remedies available to secured creditors under the UCC. See Juliet M. Moringiello, “Automating Repossession,” 22 *Nev. L.J.* 563, 584-588 (2022) (discussing state law variations).

security interests in tangible goods “to take possession of collateral without judicial process if the creditor can do so without a breach of the peace.”²¹ If the asset is considered equipment under the UCC, a secured creditor may also disable it (or render it unusable) upon default.²²

In addition, although a creditor may have a security interest in an asset in outer space, the ability to “perfect” (*i.e.*, establish “priority rights in the collateral against most subsequent lenders, buyers of the property, and lien-holders”²³) is questionable under current law. The jurisdiction in which a good is located determines “the effect of perfection or nonperfection and the priority of a nonpossessory security interest in the collateral.”²⁴

Under current law, “outer space is not subject to the jurisdiction of any state.”²⁵ Accordingly, further development in secured transactions law regarding perfection of security interests in assets in outer space is necessary.²⁶

Possible Automatic-Stay Violations

Upon the filing of a bankruptcy petition, § 362(a) of the Bankruptcy Code imposes an automatic stay on, among other creditor actions, any act to collect, assess or recover a pre-petition claim against the debtor, “any act to obtain possession of property of the estate or of property from the estate or to exercise control over property of the estate,” and “any act to create, perfect, or enforce any lien against property of the estate.”²⁷ Because the debtor’s interests in assets in outer space become property of the estate, creditors seeking to enforce their rights with respect to a bankrupt debtor’s assets in space must comply with applicable bankruptcy law.

Section 362 Case Law Addressing Remote Disablement and Automated Repossession

So far, it does not appear that a secured creditor has sought remote-disablement or automated or autonomous repossession of an asset in outer space, but that day is coming. The current body of case law that provides guidance on how courts may handle remote disablement and automated and autonomous repossession of space assets involves motor vehicles.

In *In re Franklin*, an automobile dealership, pre-petition, installed a “disabling device” or “kill switch device” on the debtor’s vehicle that allowed the dealership to remotely disable the vehicle and prevent it from starting.²⁸ The dealership activated the kill switch and repossessed the vehicle after the debtor’s bankruptcy filing.²⁹ The court found that the dealership’s “refusal to surrender possession of the Vehicle, post-petition demand for payment, and continued control of the Vehicle for weeks with knowledge of the bankruptcy, constitute[d] willful violations of the automatic stay.”³⁰

21 See *id.* at 575 (citing U.C.C. § 9-609(a)(1)).

22 See U.C.C. § 9-609(a)(2).

23 See Francesca Giannoni-Crystal, “Asset-Based Financing for Space Activities,” 89 *J. Air L. & Com.* 33, 45 (2024) (citation omitted).

24 See U.C.C. § 9-301(3)(C).

25 See Giannoni-Crystal, *supra* n.23 (citing Outer Space Treaty, Art. II).

26 See *id.* at 46-53 (discussing problem and possible solutions).

27 See 11 U.S.C. § 362(a).

28 *In re Franklin*, 614 B.R. 534, 540-41 (2020).

29 See *id.* 540-42.

30 See *id.* at 544.

In other instances, the device or system installed by the creditor required a code to be entered by the debtor to operate the vehicle and avoid disablement of the vehicle’s ignition system. The creditor provided the debtor with the code to start the vehicle once a payment had been made. A stay violation was found by the court in most of the published decisions in which courts have considered whether the stay was violated when these devices were kept on vehicles post-petition.³¹

The courts have concluded that the presence of the device on the vehicle and/or the requirement that the debtor continually obtain codes from the creditor to operate the vehicle were acts to exercise control over the property and an act to collect in violation of the stay.³² Courts may view disablement systems on space assets in the same fashion.

Implications of the Time Delay Between Earth and Outer Space

Creditors should note that communication between Earth and areas farther from Earth is not instantaneous. Until humankind finds a way to communicate faster than the speed of light, there will be a delay in communication between Earth and outer space. Thus, it is possible that a creditor will send a remote signal from Earth to an asset in outer space to disable or repossess it before a bankruptcy petition has been filed, but the remote signal disabling or repossessing the asset will not be received where the asset is located in outer space until post-petition. Therefore, the time delay could lead to a stay violation.

Conclusion

Commercialization of outer space and the technology used in the sector is in rapid-growth mode. The law regarding establishing and exercising creditors’ rights in assets in outer space is not clear-cut. Accordingly, creditors and their restructuring counsel should closely monitor the sector and the law as it progresses and evolves. **abi**

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31 See *In re Horace*, No. 14-30103, 2015 WL 5145576, at *1 (Bankr. N.D. Ohio Aug. 28, 2015); *In re Garner*, No. 09-81998, 2010 WL 890406, at *1 (Bankr. M.D.N.C. March 9, 2010); *In re Dawson*, No. 05-1463, 2006 WL 2372821, at *1 (Bankr. N.D. Ohio Aug. 15, 2006); *In re Hampton*, 319 B.R. 163, 165 (Bankr. E.D. Ark. 2005).

32 See *id.* *Contra In re Grisard-Van Roey*, 373 B.R. 441 (2007) (finding no stay violation when debtor improperly inputted codes provided by creditor).