EXHIBIT 6

MAPLE Hosted Payload

MAPLE Hosted Payload Information

1. Overview of MAPLE

MAPLE is the first space-borne demonstration of the radio frequency systems designed as part of the California Institute of Technology's High-Speed Integrated Circuits Group ("Caltech") Space Solar Power Project, a nearly decade-long academic research project involving three separate groups at Caltech aiming to develop ultra-lightweight, large scale, space deployable arrays with integrated photovoltaics. The three payload group is collectively called Space Solar Power Demonstrator 1 or SSPD-1. The following excerpt from a published Caltech article provides further details on a flexible lightweight phased array similar to that of MAPLE:

> Phased arrays are multiple antenna systems capable of forming and steering beams electronically using constructive and destructive interference between sources. They are employed extensively in radar and communication systems but are typically rigid, bulky and heavy, which limits their use in compact or portable devices and systems. Here, we report a scalable phased array system that is both lightweight and flexible. The array architecture consists of a self-monitoring complementary metal–oxide–semiconductor-based integrated circuit, which is responsible for generating multiple independent phase- and amplitude-controlled signal channels, combined with flexible and collapsible radiating structures. The modular platform, which can be collapsed, rolled and folded, is capable of operating standalone or as a subarray in a larger-scale flexible phased array system. To illustrate the capabilities of the approach, we created a 4×4 flexible phased array tile operating at 9.4–10.4 GHz, with a low areal mass density of 0.1 g cm^{-2}. We also created a flexible phased array prototype that is powered by photovoltaic cells and intended for use in a wireless space-based solar power transfer array.[1]

MAPLE will demonstrate the microwave array portion of the project and, in conjunction with other components of the SSPD-1 payload, will demonstrate the deployable structures and ultralight photovoltaics. These experiments will provide critical testing and verification as the entire project group looks forward to more ambitious combined demonstrations in the future.

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[1] M.R.M. Hashemi *et al.*, A Flexible Phased Array System with Low Areal Mass Density, Nature (2019), https://www.nature.com/articles/s41928-019-0247-9.

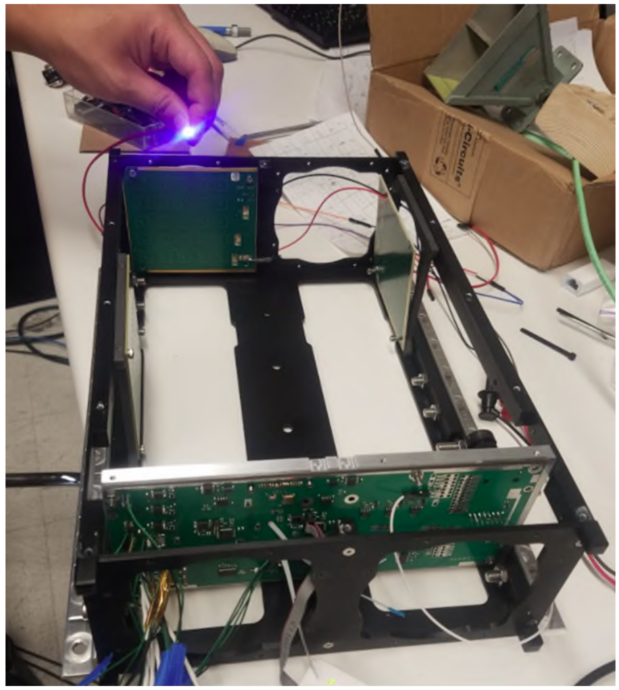
Even though the power MAPLE will beam to earth is quite small, it is a crucial step and proof of concept for the next phases of the project.

2. The MAPLE Experiment

MAPLE will be a small, low power, 32 element light-weight flexible phased array, constructed using technology that can later be used for larger systems. It uses constructive and destructive interference among the sources to generate focused pockets of energy that can be used for communication and power transfer. The concept of this experiment is to use a small, lightweight version to send into space to advance the technology development and explore its utility as a means of improving space-to-earth communications. If, as expected, this experiment proves the technology can be used, Caltech hopes to be able to follow with additional missions further proving the technology.

MAPLE is a 6U sized unit. The following images, Figures 1-6, illustrate the MAPLE system that will be hosted and permanently affixed on the Momentus satellite.

<u>Figure 1</u>: This shows the phased array working on a bench, with the phased array radio signals lighting an LED. Using the radios to achieve this is the key to this experiment. The MAPLE frame will be enclosed in multiple layers of conductive MLI (multi-layer insulator) that serves as an electromagnetic shield, with the exception of the circular (5 cm diameter) aperture.



Lighting an LED with the power radiated by the array.

Figure 2: A CAD drawing of the frame enclosure of MAPLE: 10 cm high, 20 cm wide, and 30 cm long

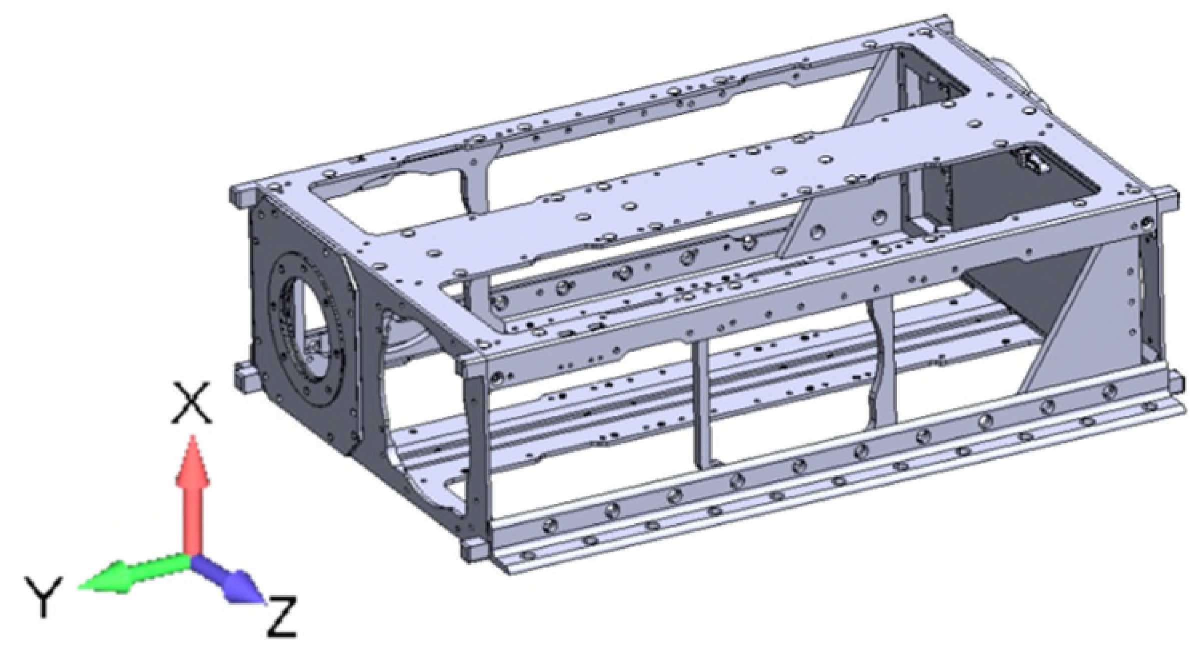
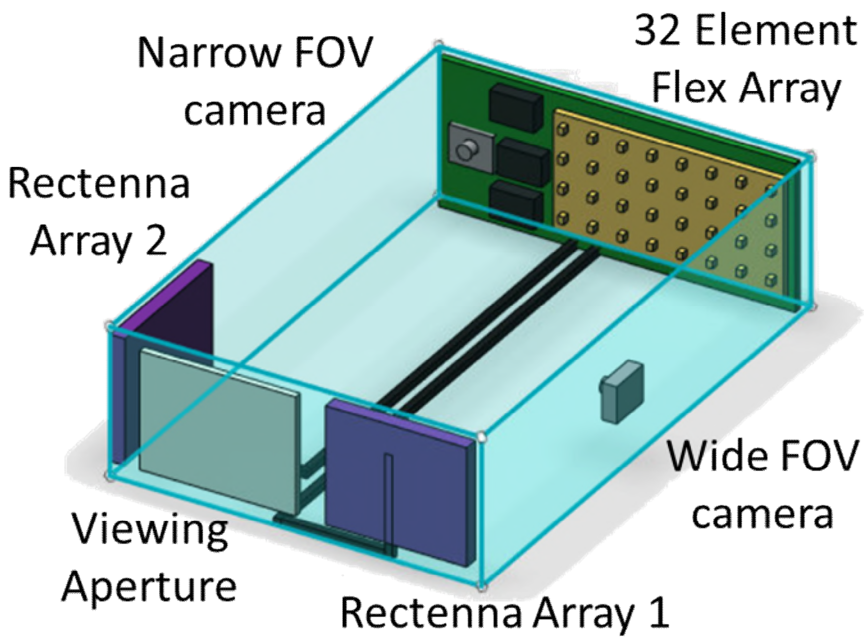


Figure 3: This diagram depicts the phased array, rectenna array receivers, & cameras:



Included as an attachment to this exhibit is a letter from the National Oceanic and Atmospheric Administration ("NOAA") to Caltech, confirming that a satellite imaging license is not required for the cameras associated with the Caltech SSPD-1 payload.[2]

[2] To be clear, Momentus has obtained a NOAA license for its cameras (not related to the Caltech SSPD-1 payload) that the company operates as part of the mission. *See* Application Narrative, at 7 n. 11.

Figure 4: Flight Flex Board Mount, note relatively small size of MAPLE, only 10 cm high.

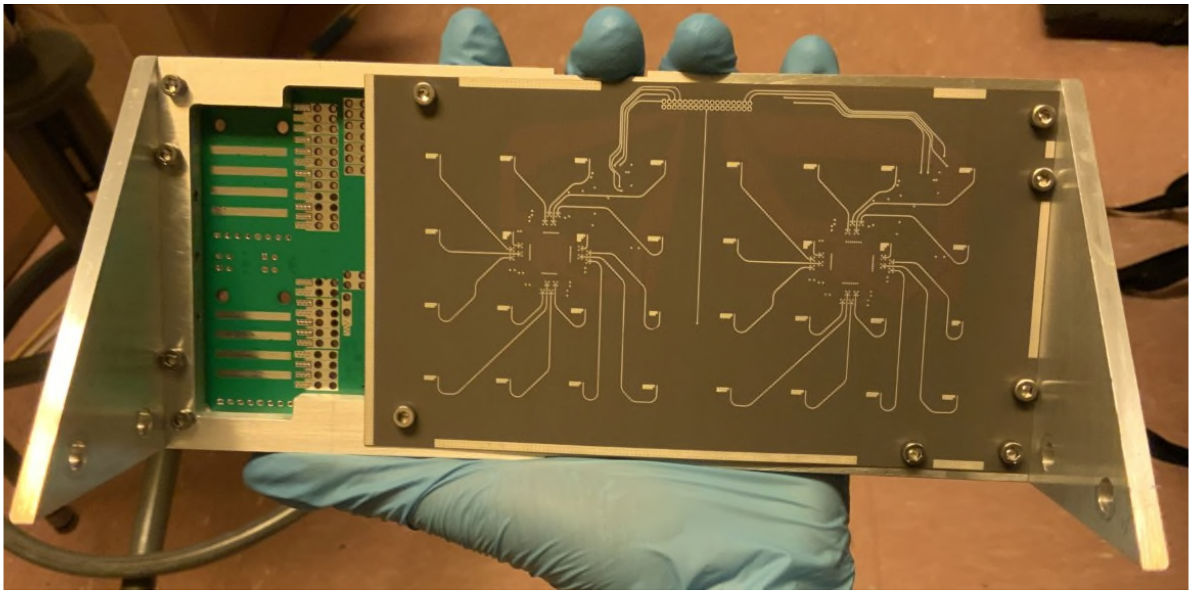


Figure 5: The phased array antennas installed.

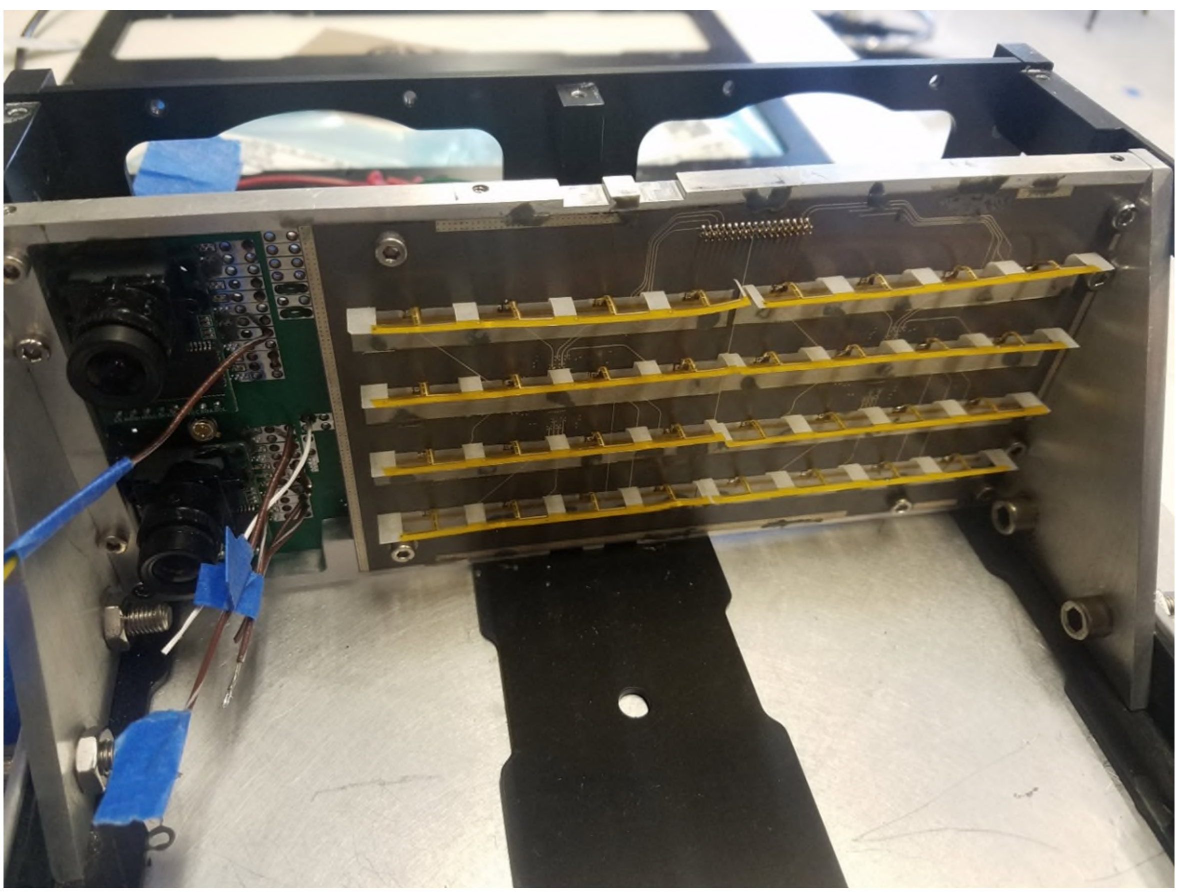
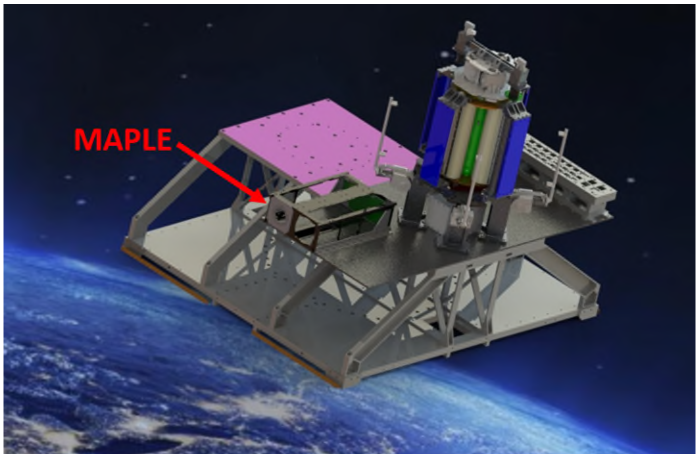


Figure 6: CAD model of Vigoride satellite with MAPLE and other components of SSPD-1.



3. Radio Operations

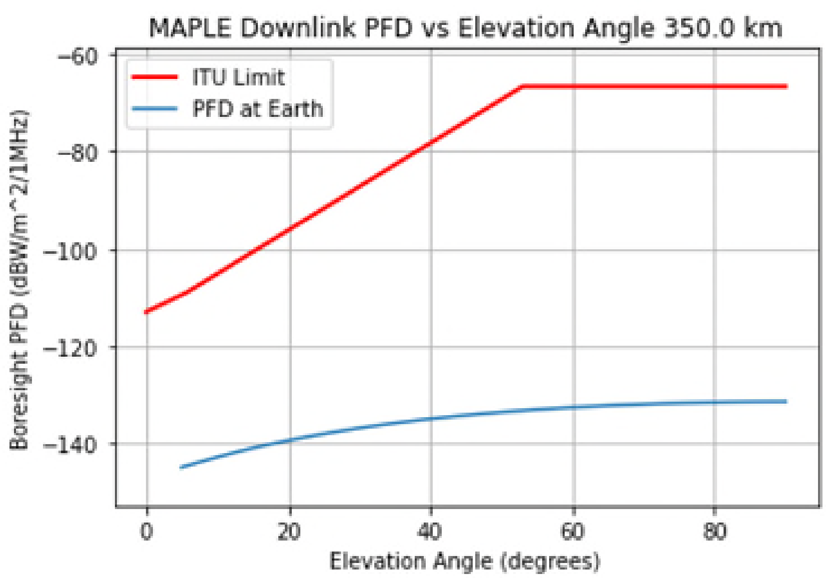
On-board satellite operations: In the first phase of the experiment, the phased array will focus the microwave beam at close proximity targets within the MAPLE system, rectenna arrays 1 and 2. Repeated focusing with a variety of algorithms and conditions will provide valuable insight into the operation, robustness, and aging of the system. The phased array focuses the RF energy, giving an ERP of 38 dBm inside the enclosed frame. There are no intentional transmissions outside of MAPLE from this testing, but there is anticipated signal leakage of 30 dBm ERP.

Summary of Technical Parameters for On-board Satellite Operations

- Area of Operations: LEO orbit, hosted on VR-5
- Emission designator: 10M0N0N
- Spectrum: 9984 MHz, occupied bandwidth of 10 MHz
- Power levels: 0.6 W output power, 30 dBm ERP (signal leakage)
- Time of radio use: maximum of 6 hours operation per day, more likely 3 hours

Transmissions to Earth: In the second phase of the experiment, the phased array will focus the microwave beam out of a small window in the payload enclosure, the viewing aperture in Figure 1. The focused beam will be directed toward the Earth for detection by a ground station. The ground station will be receive-only. For this transmission, the ERP will be 38 dBm. The aperture through which the signal will be transmitted is small, and the signal is not very powerful. The Commission's rules do not specify a PFD limit in the 9984 MHz band; however, there are PFD limits specified in rule No. 21.16 of the ITU Radio Regulations. The maximum PFD levels for the MAPLE transmissions were calculated for the 9984 MHz band. The results are provided in Schedule S and demonstrate that the downlink PFD levels of the MAPLE carriers do not exceed the limits specified in rule No. 21.16 of the ITU Radio Regulations.

The chart below illustrates the MAPLE downlink PFD values in comparison with the ITU PFD limits. This figure represents the maximum transmitted EIRP when the satellite is at the orbital altitude of 350 km (the lowest orbital altitude for which MAPLE will be transmitting).



<u>Summary of Technical Parameters for Transmission to Earth</u>

- Area of Operations: LEO orbit, hosted on VR-5
- Emission designator: 10M0N0N
- Spectrum: 9984 MHz, occupied bandwidth of 10 MHz
- Power levels: 0.6 W output power, 38 dBm ERP
- Time of radio use: a maximum of 4 15-minute transmissions per day

As explained above, the MAPLE system will be physically affixed to the Momentus satellite as a hosted payload. The satellite will provide the power, data uplink and downlink, and all the command and control of the satellite. Caltech will be able to provide instructions to MAPLE over the Vigoride links, but not independently. Data from MAPLE will be sent to Caltech over the Vigoride communications links as well.

The transmissions to the Earth from MAPLE will have no communications content. They are simply radio pulses used to validate that MAPLE's signals are being transmitted to the ground by the phased array, providing a vital validation of the Caltech team's experimental technology.

4. Time of Spectrum Use

<u>On-board satellite operations</u>: When the satellite is on orbit, the phased array system will be relying on the host's power system and data links. As a result, the operations will be very limited. For the first phase of the experimentation, which will occur after all other customer payloads are deployed from VR-5, MAPLE is expected to operate for up to 6 hours per day. This phase involves no intentional RF transmissions outside of the satellite, although as noted above, there is some anticipated signal leakage of the signals being transmitted at 9984 MHz.

<u>Transmissions to Earth</u>: In the second phase of the experiment, MAPLE will transmit to the Earth on the 9984 MHz frequency. These transmissions will occur at most a maximum of four times a day (more likely once per day) for no more than 15 minutes each transmission and will occur only when the Momentus satellite is over the ground station at Caltech.

Because there are multiple passes per day and the transmissions are not time sensitive, Momentus and Caltech will be able to coordinate its operations and further mitigate potential interference concerns, as necessary. This experiment is expected to last for the duration of the VR-5 mission, which is anticipated to last 250 days or less.

5. No Likelihood of Interference

MAPLE's proposed output power level and ERP are very low. The power levels are constrained, in part, by the power source available on the satellite host. By using a high-gain ground station antenna, Caltech will be able to receive the MAPLE signal, even though the receive level of the signal on the ground will be very low, as discussed below. Further, transmissions within the MAPLE unit, which are not intended for reception on the Earth, are within a shielded enclosure and could not feasibly impact any authorized operators.

The 9900-10000 MHz band, which includes the frequency 9984 MHz, is allocated for radiolocation, and internationally for meteorological-satellite services.[3] The low-powered signals from MAPLE are not expected to cause interference to authorized operators in this band. The Momentus satellite will be lower in orbit than many other low-Earth orbit satellite operations, with MAPLE transmissions pointed toward the Earth when the satellite is over the U.S. This means that MAPLE will not likely be pointing at any other satellites as it directs its signal to the earth, briefly, each day.

Taking free space pathloss into account with a worst-case minimum distance (elevation) of 350 km (the lowest orbital altitude for which MAPLE will be transmitting), the anticipated signal level would be less than -120 dBm at the Earth's surface. This very low-powered signal is not likely to cause any interference to authorized radiolocation terrestrial operations and the internationally allocated meteorological-satellite services in the band. Neither type of operation is likely to notice, much less be affected, by such a weak signal.

[3] *See* 47 C.F.R. § 2.106.

Attachment

NOAA Letter

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL ENVIRONMENTAL SATELLITE, DATA,
AND INFORMATION SERVICE

March 19, 2021

Mr. Sergio Pellegrino
Director
California Institute of Technology
1200 East California Blvd.
Pasadena, CA 91125

RE: NOAA Commercial Remote Sensing Regulatory Affairs License Inquiry

Dear Mr. Pellegrino:

Pursuant to 15 CFR § 960.5(a), the National Oceanic and Atmospheric Administration's (NOAA) Commercial Remote Sensing Regulatory Affairs (CRSRA) office has reviewed your Initial Contact Form, submitted on March 16, 2021, and discussions held with CRSRA on March 17, 2021 concerning your proposed Space Solar Power Demonstration-1(SSPD-1) private remote sensing space system. Under the authority of the Secretary of Commerce under 51 U.S.C. § 60121 *et seq*. and 15 CFR Part 960, delegated to NOAA, we have determined that the proposed system as described in your Initial Contact Form does not fall within the Secretary's jurisdiction and therefore will not be required to apply for a NOAA license. This determination was made based on your description that your system will deploy an arm with a camera to self-image. That type of mission falls within the exception to the licensing requirement found in 15 CFR § 960.2(b). This determination does not relieve you of the obligation to apply for any other U.S. Government licenses, permissions, or permits your activities may require.

This determination applies to your SSPD-1 system only and is based on the Initial Contact Form submitted on March 16, 2021. If the factual circumstances of the information provided change, please submit a new Initial Contact Form, as you may be subject to the Secretary's jurisdiction. Additionally, please contact CRSRA with any future systems you may plan to operate in order to obtain a licensing determination on that specific system and its mission.

Please refer any questions regarding this determination to CRSRA at 301-427-2560 or by email at CRSRA@noaa.gov.

Sincerely,

Tahara D. Dawkins
Director, Commercial Remote Sensing
Regulatory Affairs

cc: Glenn Tallia, NOAA GC