



PERMITTING DECISION SUMMARY

Wildstar LLC

Marvel-X-1, Marvel-X-2 & Marvel-X-3

1. Wildstar LLC is a company incorporated in the United States developing small satellites for space-based communication.
2. The purpose of the Marvel-X satellites is to test their communication capabilities and on-board orientation control systems in orbit.
3. The Marvel-X 2 and 3 satellites are testing the magnetorquer system on board. This is a method of controlling the attitude of a spacecraft, which can be achieved by interaction with the Earth's magnetic field. The satellites both have a mass of 11kg.
4. The Marvel-X-1 satellite is testing a different three-axis reaction wheel-based orientation control system and therefore has a slightly larger mass of 12 kg.
5. Each satellite has propulsion capabilities, which allows the satellite to adjust its position, maintaining the orbital position of the satellite and to allow for deorbiting capabilities at the end of the satellites life.
6. Payloads are permitted in line with the [Outer Space and High-altitude Activities Act 2017](#) and the [Outer Space and High-altitude Activities \(Licences and Permits\) Regulations 2017](#).
7. Each payload has been approved by the Minister for Economic Development, on advice from officials across agencies. When approving payloads, the Minister needs to be satisfied that:
 - a. The applicant has taken and will continue to take all reasonable steps to safely manage the operation of the payload;
 - b. The proposed operation of the payload is consistent with New Zealand's international obligations; and
 - c. The applicant has an orbital debris mitigation plan that meets prescribed requirements.
 - d. Despite being satisfied of these matters, the Minister may nevertheless decline a permit if he is not satisfied that the proposed operation of the payload is in New Zealand's national interest.

Date Granted	Authorisation Number	Payload Name	Owner or Operator	Country of Origin
17 December 2021	210199-PPT	Marvel-X-1-3	Wildstar LLC	United States