Your response

Question	Your response
Question 1: For future outdoor use of 26 GHz, do you agree that the proposed exclusion zones will provide appropriate protection to the 6 radio astronomy sites? If not please explain your reasons for this providing any supporting evidence.	Confidential? – No No response
Question 2: For indoor use of 26 GHz, do you agree that additional measures are not needed to protect radio astronomy sites and that we should remove the existing 1 km exclusion zone around Jodrell Bank and Cambridge from the current 26 GHz indoor-only shared access licence product? If not, please explain your reasons for this providing any supporting evidence.	Confidential? – No No response
Question 3: Do you agree with our proposal to limit the number of 26 GHz base stations in 24.25-25.05 GHz to protect EESS (passive) use at 24 GHz? If not, please explain your reasons for this providing detailed supporting evidence.	Confidential? – No **We agree that limits on out of band emissions are needed, however those proposed are unlikely to provide sufficient protection to passive remote sensing operating at 24 GHz.** As noted in the consultation document, the EESS (passive) use at 24 GHz is associated with specific properties of EM transmission through the atmosphere and are used to detect small variations in the Earth system. Satellite-based Earth observation data is unique in its ability to provide observations from large and remote areas, which is especially important for capturing the early development of weather systems which can go on to have severe impacts on the UK. Observations made in the 24 GHz band are particularly valuable as they are not impacted by the presence of clouds, allowing widespread and consistent measurements to be made on a global scale. Data from observations made in this band over the oceans is currently assimilated into

	operational weather forecasting systems at the Met Office (and other national meteorological services). The 24 GHz band forms part of a set of passive microwave observations which contribute approximately 25% of the overall short-range forecast skill from observations in the Met Office:the second largest of any observation system. The operational weather forecasting systems which use these data provide a range of weather services. These include the UK's National Severe Weather Warning Service which provides the emergency response community and UK public with advanced warning of impacts caused by severe weather such as disruption to transport networks, risk of injury and danger to life. The 24 GHz frequency band has been used by satellite sounders for over 20 years. These data are a vital part of the Earth's long-term climate record, used to monitor the climate and understand how it is changing. This relies on long-term consistent records in order to detect and attribute changes in the Earth system over long periods. Data from observations made in this band over land areas is not currently used operationally in the Met Office, however its use is an active area of research which could unlock additional benefits from existing missions. **Our studies have shown that even with the proposed limits, out of band emissions over land would make this 24 GHz band data unusable over land. This would hamper the ability to deliver additional benefits from existing measurements.** **Our studies have also shown the potential for out of band emissions from land-based transmitters to degrade the quality of data over coastal areas. Given the small natural signals being detected, a key concern in these areas would be levels of interference which are small enough to be realistic – and thus not rejected – but large enough to corrupt the measurement. As these data are currently used in operation systems, this could impact**

	on operational weather services and climate monitoring. These observations are core to the delivery of Met Office weather and climate services; conversely a loss of observational capability would have negative impacts on our services such as the National Severe Weather Warning Service, essential en-route global aviation forecasts and climate monitoring datasets which underpin global negotiations such as COP. The latest Public Weather Service Value for Money Review[1] (in March 2015) concluded with high confidence that the benefits of the Public Weather Service are likely to be close to £1.5bn per annum. This includes benefits to the public, aviation, land transport, flood damage avoidance and storm damage avoidance. The review also found that for weather services as a whole, the benefits are likely to exceed £2bn. **The loss of access to high quality observations at 24 GHz free from interference would be a backwards step for weather forecasting capability and the benefits it delivers to the UK.** Such a reduction in observational capability would reduce the quality of weather forecasts and hinder our ability to predict severe weather – including that which poses a danger to life – reducing the lead-time at which weather warnings can be issued, limiting the amount of time which the public and emergency responders have to prepare for such conditions.
Question 4: Do you agree with the technical analysis set out in Annex 2? If not, please explain your reasons for this providing detailed supporting evidence.	Confidential? – No Our studies confirm that a threshold of - 37 dBW is acceptable for the microwave sounders operating in bands adjacent to 26 GHz. However our calculations show that if 443 base stations are within the field of view of a sensor, this would lead to a 26 dB increase in power levels, 443 times the - 37 dBW stated limit.

[1] https://www.metoffice.gov.uk/about-us/what/pws/value