**Functional Requirements**

1. **Air Quality Measurement**:
   * The device shall measure and detect particulate matter levels using the PMS7003 sensor.
   * The device shall measure volatile organic compounds and other harmful gases using the BME680 sensor array.

Still reconsidering the location addition at the moment.

1. **GPS Integration**:
   * The device shall identify and record the user's real-time location using the Neo 6m/Grove GPS.
   * It should timestamp air quality measurements with the respective GPS location.
2. **User Alerts on the Wristband**:
   * The wristband shall trigger a vibration and sound alert if detected air quality levels surpass predefined hazardous thresholds.
   * The wristband shall exhibit a light to indicate the severity of the air quality (green for good, yellow for moderate, red for poor).
3. **Mobile Phone Notifications**:
   * In the event of a hazardous air quality detection, a notification shall be sent to the connected mobile phone detailing the air quality measurements.
   * The mobile app shall display levels of particulate matter, VOCs, and maybe current GPS coordinates.
4. **Data Storage**:
   * Air quality measurements, timestamps, and locations for at least the previous 48 hours shall be stored on the mobile application.
   * Users shall have an option on the app to reset or clear this stored data.
5. **Battery Status**:
   * The mobile app shall display the current battery level of the wristband.
   * It should notify the user when the battery level goes below a certain threshold.

**Non-Functional Requirements:**

1. **Usability**:
   * The wristband should minimize physical interaction, with the mobile app serving as the primary interface for detailed information.
   * Alerts and notifications should be easily distinguishable and understandable.
2. **Portability**:
   * The device should be lightweight and comfortable for daily wear.
   * It should have a design that is aesthetically pleasing and suitable for various environments (work, sport, casual).
3. **Battery Life**:
   * The wristband should operate for at least 48 hours on a full charge, considering minimal interactions.
4. **Accuracy**:
   * Air quality measurements should have an error margin of less than 5%.
   * If using location then GPS coordinates should be accurate to within 10 meters.
5. **Durability & Robustness**:
   * The wristband should be resistant to everyday wear and tear.
   * It should be splash-proof to handle minor exposures to water.
6. **Response Time**:
   * The device should relay air quality measurements to the mobile app with a delay of no more than 5 seconds.
   * Alerts should be triggered on the wristband within 5 seconds of a hazardous threshold being detected.
7. **Compatibility**:
   * The wristband's connected app should be compatible with major mobile OS.
8. **Scalability**:
   * Future versions should allow for easy integration of additional sensors or features without a complete overhaul of the system.