Groundwater Level Monitoring Network

- **What does this dashboard relate to:**

  This dashboard shows the groundwater monitoring points that are managed by the DWS. It shows the trends over time relating to the number of open and closed stations. These trends are shown since coordinated groundwater monitoring started in South Africa. It also shows the percentage of reliable data available per station. A key reporting item of the dashboard is the number of stations that have recent data available, which is commensurate with the frequency at which monitoring is undertaken. This frequency varies from fine time scale electronic reading at some stations, to manual biannual readings at others. Meta data associated with each monitoring station is also provided, and it is possible for users to analyse the available points in relation to their needs.
  From a management perspective, the dashboard shows the number of stations with data that is considered acceptable, of concern, and unacceptable relative to the monitoring frequency of the station. It can be used to identify those regions, and stations, where there are many stations with data that needs to be uploaded into the Hydstra database.

- **What type/s of questions does the information product aim to answer:**
  - The dashboard aims to answer the following questions:
    - What are the trends in surface water monitoring by DWS in relation to the number of open versus closed stations?
      - The number of active groundwater monitoring stations in South Africa peaked during the 1970s and 1980s. Since this period, the number of stations with active monitoring has been declining. It is important for managers to be aware of the number of monitoring locations, especially due to the importance of groundwater related data being required for effective management and utilisation of the resource.
    - How does the most recent data in the database for a specific station compare with the specified monitoring frequency of that station. This is referred to as the 'Recent Data Availability Status'.
      - Monitoring stations are visited by technicians at different time intervals, for example monthly, quarterly, biannually or on an infrequent basis. Once data has been collected at the station, there is a delay associated with processing and upload of the data into the Hydstra database. The management criteria are that this delay should not take more than 2 months. Therefore, if a station is visited on a monthly basis, the latest available data should be within a 3 month period relative to the current date. If the available data is not within this period, the dashboard will start to show a concern status for the station, and if the delay is even larger, it will display an unacceptable status. The thresholds for the different 'Recent Data Availability Status' for defined monitoring frequencies is summarised in the table below:

Monitoring frequency	Acceptable	Concern	Unacceptable
Monthly (1 month)	<3 months	≥3 months ≤4 months	>4 months
Quarterly (3 month)	<5 months	≥ 5 months ≤6 months	>6 months
Biannually (6 month)	<8 months	≥8 months ≤9 months	>9 Months

The ‘Recent Data Availability Status’ is then summarised per provincial Hydrology office and / or region. These summaries can be used to identify those regions where possible improvements need to be made.

- What is some of the station specific Meta data associated with monitoring locations?
  - The dashboard shows in a table format some of the Meta data that is relevant for the groundwater monitoring stations. This information is extracted from relevant fields in Hydstra, and allows the user of the dashboard to have access to some additional details of the stations. This is the information that is shown in the pop-up window.

- **Data / Information discussion:**
  - What data is used?

    All groundwater data collected by DWS is stored in a commercial hydro-informatics database called Hydstra. The data is collected in the field at monitoring stations which are maintained and operated by DWS regional office staff. The information collected is critical for the effective and sustainable management of groundwater resources in South Africa.

  - How is it extracted and from where?

    Some Meta data is populated in the table format that is relevant for the groundwater monitoring stations. This information is extracted from relevant fields in Hydstra by NIWIS.

  - How often is it extracted?

    The data is extracted weekly.

- **Person(s) who championed the dashboard:**
  - Mr BayandaZenzile, Scientific Manager, HS: Hydrological Services

- **Enquiries:**
  - For all dashboard enquiries click **HERE** to go to the Contact Us page.

- **Links to other sources of related information**

  The following link is for the groundwater section website at DWS, with further links to relevant information about groundwater monitoring done by DWS. There are also other information products (GIS maps) available on the website.

  http://www.dwaf.gov.za/groundwater/

- **Are there any limitations / cautions related to using this information?**

Yes, please refer below:

There are no limitations / cautions associated with using the information on this dashboard. The information on the ‘Recent Data Availability Status’ is a reflection of the current dataset stored in the database. If a station is marked as ‘concern’, or ‘unacceptable’, it does not mean that the entire station is of concern or unacceptable. It rather means that the last available data point is older than expected, relative to the monitoring frequency that has been specified for the station. When it comes to the actual groundwater data supplied by DWS from Hydstra, the correct understanding and data analysis techniques should be applied when using the data. More details can be requested from the contact person above.