Peter Bond
Hampshire County Council
via email

23 June 2022

Our ref: 331201108pbond002.Docx

Dear Peter,

Re: Proposed extraction of sand and gravel at Hamble Airfield: further response to consultee queries

Stantec UK Ltd (Stantec) has been forwarded the following documents for response by CEMEX UK Operations Ltd. (CEMEX).

- Letter from Miss Suz Greenwood, Planning Advisor, Environment Agency. Reference HA/2022/123908/01-L01, dated 24 February 2022, and
- Letter from Nick Donoghue, Network Rail, dated 14 March 2022.

Stantec undertook the hydrogeological and hydrological impact assessments that supported the planning application and we have been asked to respond on the points raised in relation to hydrology and hydrogeology.

Environment Agency letter

The Environment Agency has reviewed the Desk Top / Site Walkover assessment undertaken by Ground Condition Consultants Ltd, dated April 2018. It has not provided comment on the Water Environment and Flood Risk Chapter of the Environmental Statement submitted with the planning application, which supersedes the Desk Top / Site Walkover assessment. We recommend that the Environment Agency provides comment on this latter documentation.

In response to comments made regarding the Desk Top / Site Walkover assessment, we note that any contamination associated with operation of the Site as an airfield up until the 1980's will have been in the ground for over 30 years. Any volatile components will have volatilised many years ago and any mobile components will have been flushed through the sand and gravel via infiltrating rainwater. If any residual contamination remains, it is likely to be in the form of immobile species, either insoluble or highly sorbed to the natural strata.

As detailed in the Water Environment and Flood Risk Chapter of the Environmental Statement, there is little groundwater present within the superficial deposits, which forms the mineral to be extracted. Therefore, there will be limited dewatering, which will largely consist of pumping surface water collecting in the base of the excavation area to adjacent areas.

We note that the chances of detecting such contamination, via site investigation, would be very small. One of the reasons for the Environment Agency making the comments on contamination was the possible presence of trace hydrocarbon recorded at BHE/08 between 4.5 and 4.8 m below ground level, which was described as a 'Black dry residue on gravel. No oil sheen on water'. We note that two boreholes have subsequently been drilled close to BHE/08; BH05 in May 2011 and W05 in November 2018. Neither of these boreholes recorded any black residue on the gravel, suggesting that its presence is extremely localised. W05 did not strike any groundwater, whilst BHE08 stuck water at 4.72 mbGL (0.58 m above the base of the sand and gravel deposit) which rose to a steady level of 2.40 m. However, the groundwater level has been monitored at BHE/08 from 2012 to the

current time and is usually recorded as dry. (W05 is installed and monitors groundwater in the Selsea Sand Formation below the sand and gravel deposit).

Thus, we consider that the risk posed by mobilising low solubility in-situ contamination, largely present above the watertable, to be negligible and the likelihood of detecting any significant quantities of such contamination too low to justify further site investigation.

Network Rail letter

Network Rail has raised a holding objection, based on concerns regarding the effects of localised dewatering adjacent to the railway line and due to impediment of groundwater flow following restoration with imported lower permeability inert restoration materials.

The railway line runs along the northern edge of the Site, adjacent to Phase 1, which will be the first Phase to be excavated at the site. Figure 1 shows the depth to groundwater in the superficial deposits at the groundwater monitoring wells at the Site (see Figure 8.14 in Chapter 8 of the Environmental Statement for well locations). BH01, WG02 and BHC/08 monitor groundwater along the northern edge of the Site.

Railway settlement

There will be no 'impermeable surround' placed around the freshwater lagoon or silt pond. These features have been located within the Site where the groundwater saturated thickness is greatest, and the freshwater lagoon will be in hydraulic continuity with the local groundwater. The sand and gravel reserve at these locations will be excavated wet without any dewatering. Where silt is placed (in the north east corner of the Site), this will be placed by settlement into water and there will be no dewatering at any time in the Site's lifecycle at the silt ponds. At the end of the excavation period, any remaining freshwater lagoon void will be restored using imported inert restoration materials. It is likely that an attenuation layer will be required on the base and sides of the lagoon prior to placement of the imported material, and temporary dewatering is likely to be required to facilitate the placement of the attenuation layer on the base. Once the attenuation layer has been placed, imported material will be placed on top and the groundwater level allowed to recover. The timescale for dewatering will thus be limited to a maximum of three months.

During dewatering, there is a potential for groundwater levels below the railway cutting to be reduced. Any reduction in groundwater level would increase the effective stresses in the ground and thereby could induce consolidation settlement of the ground and any supported development. The degree of settlement that could occur is dependent on the magnitude of groundwater drawdown and the geological units affected.

We have undertaken a preliminary assessment of the potential effects on the railway. To inform this, consideration has been given to the ground conditions adjacent to the railway line as summarised in Table 1.

Table 1 Ground conditions under railway

Description	Northwest	Northeast
Base of Railway Cutting, mAOD	~17.0	~18.5
Groundwater Level, mAOD	~15.0 to 17.0	~19.5 to 21.5
Base of Sand and Gravel, mAOD	~11.5	~19.0

For the worst-case scenario, groundwater level may be reduced by about 1 and 4 m in the area of the workings. Based on the assumed aquifer properties, the radius of drawdown is assessed to be about 300 m. On this basis, the maximum drawdown below the railway is estimated to be between 1.5 and 2.5 m. The associated increase in effective stress below the railway would be between 15 and 25 kPa. Given the relatively low compressibility of the sand and gravel and the underlying solid geology, any resulting settlement of the railway is expected to be less than 10 mm. The associated differential settlements are governed by the gradient of the drawdown curve and are expected to be less than 1 mm in 10 m.

Given the expected settlements, any short-term dewatering is not expected to result in significant movements of the railway adjacent to the Site and the consequent risk of damage to the railway is considered to be very low.

Impediment of groundwater flow

We note that there is little groundwater present within the superficial deposits to the south of Phase 1 of the proposed quarry, particularly on the western and southern sides. The gaps in the hydrographs for the wells to the south of Phase 1 shown on Figure 1 mostly represent occasions when the wells are dry. To illustrate this further, we have enclosed plots showing the dip to water and plumbed base of each of the wells that are monitoring the sand and gravel deposits, which show the limited saturated thickness and periods when wells are dry within the sand and gravel deposit.

Rainwater infiltrating the superficial strata is able to migrate laterally and downwards into the underlying permeable Selsey and Earnley Sand Formations. Following placement of lower permeability restoration material in the quarry void there will be a greater proportion of groundwater migrating below and to the sides of the Site. A slightly steeper hydraulic gradient will develop which will result in slightly higher groundwater levels to the north of the Site. However, given the permeability of the sand and gravel deposits, it is likely that this will be in the order of a few centimetres. This increase will dissipate with distance north and at the railway cutting will be very small. Within the context of the annual fluctuation of groundwater level, which is typically 1 – 2 m, the net rise in groundwater level to the north of the Site will be trivial and the consequent risk of damage to the railway is considered to be very low.

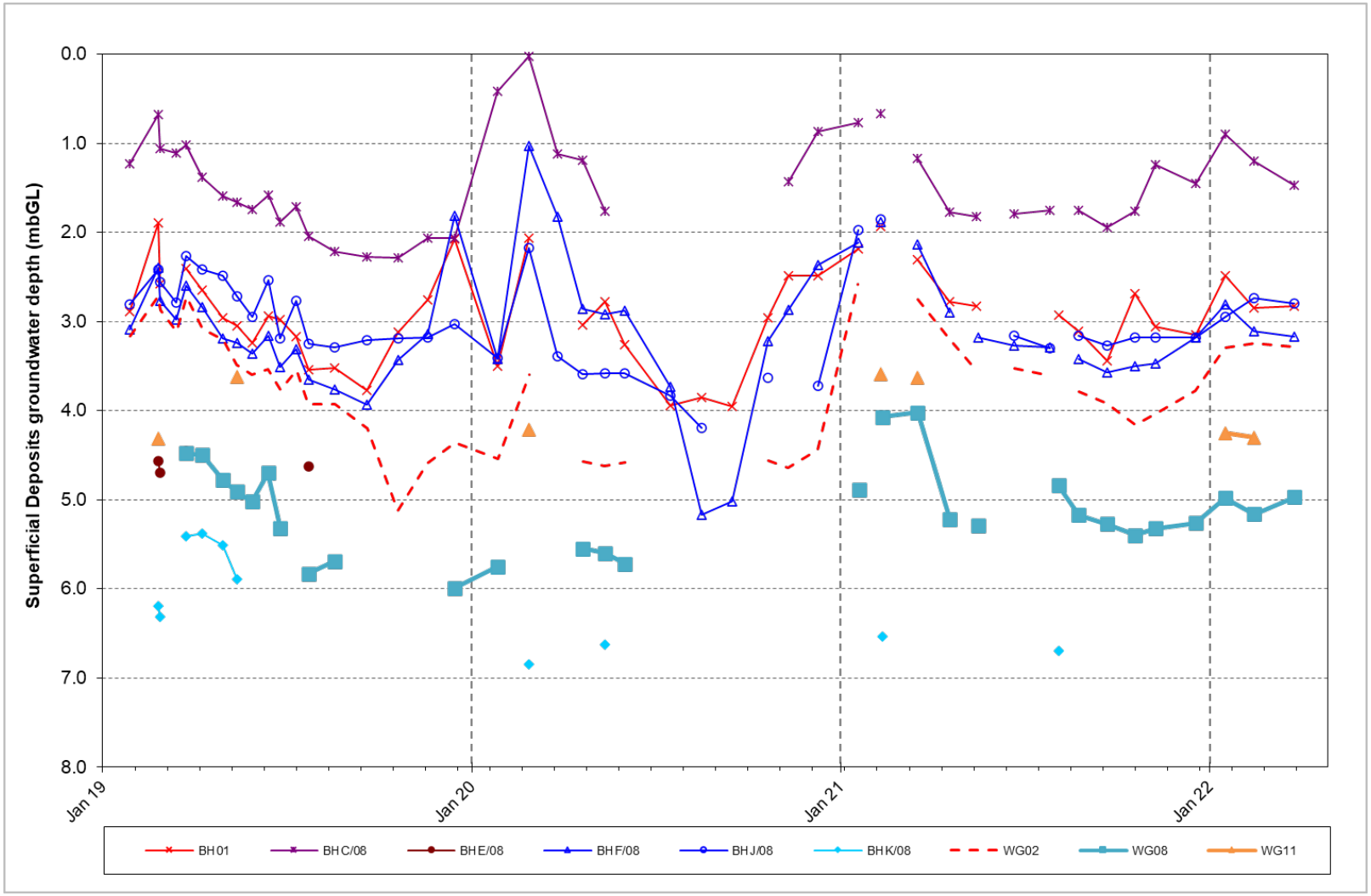
Groundwater monitoring wells are located to the north of the fill area; BH01, WG02 and BHC/08 monitor the sand and gravel deposit along the northern boundary of the Site. Groundwater levels are measured on a monthly basis and these data would provide an early warning should groundwater levels rise due to placement of the imported restoration fill and allow for remedial action to be taken. Remedial action could take the form of creating groundwater drains to transfer groundwater to the south, away from the railway line.

Other matters

CEMEX will undertake to maintain procedures to detail actions to be taken in the event that unexploded ordnance is encountered during excavation. These procedures will take account of the proximity to the active railway line.

With respect to the suggested conditions, CEMEX confirms that it would have no issues with the conditions stated being applied to the Permission.

Figure 1 Superficial deposit hydrographs – depth below ground level



Summary

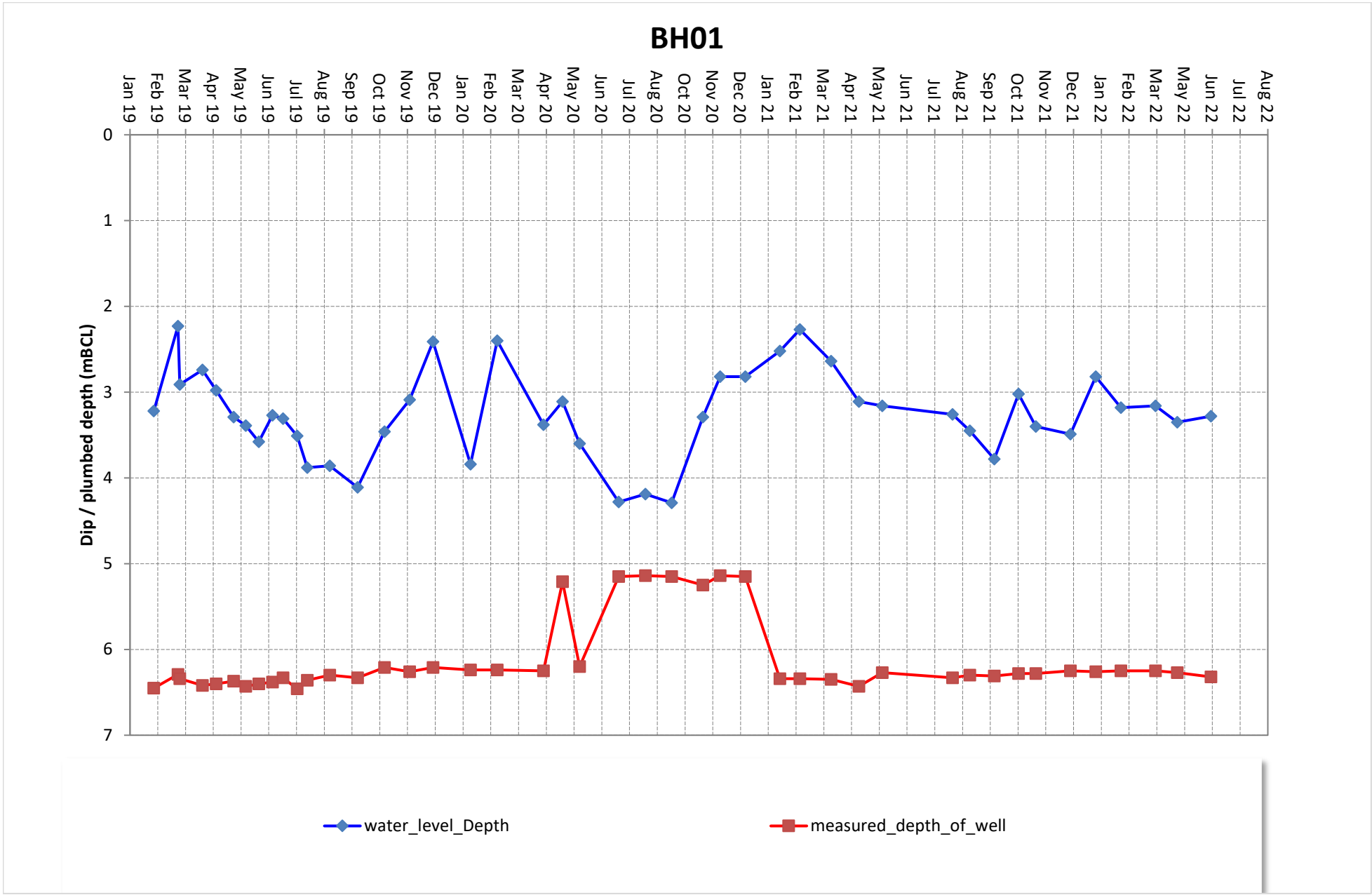
We trust that the comments made above resolve the concerns raised by the stakeholders.

Yours sincerely

Robert Sears

PRINCIPAL CONSULTANT

Enc. Dips and plumbed depths


BH01
Dip / plumbed depth (mBCL)
0
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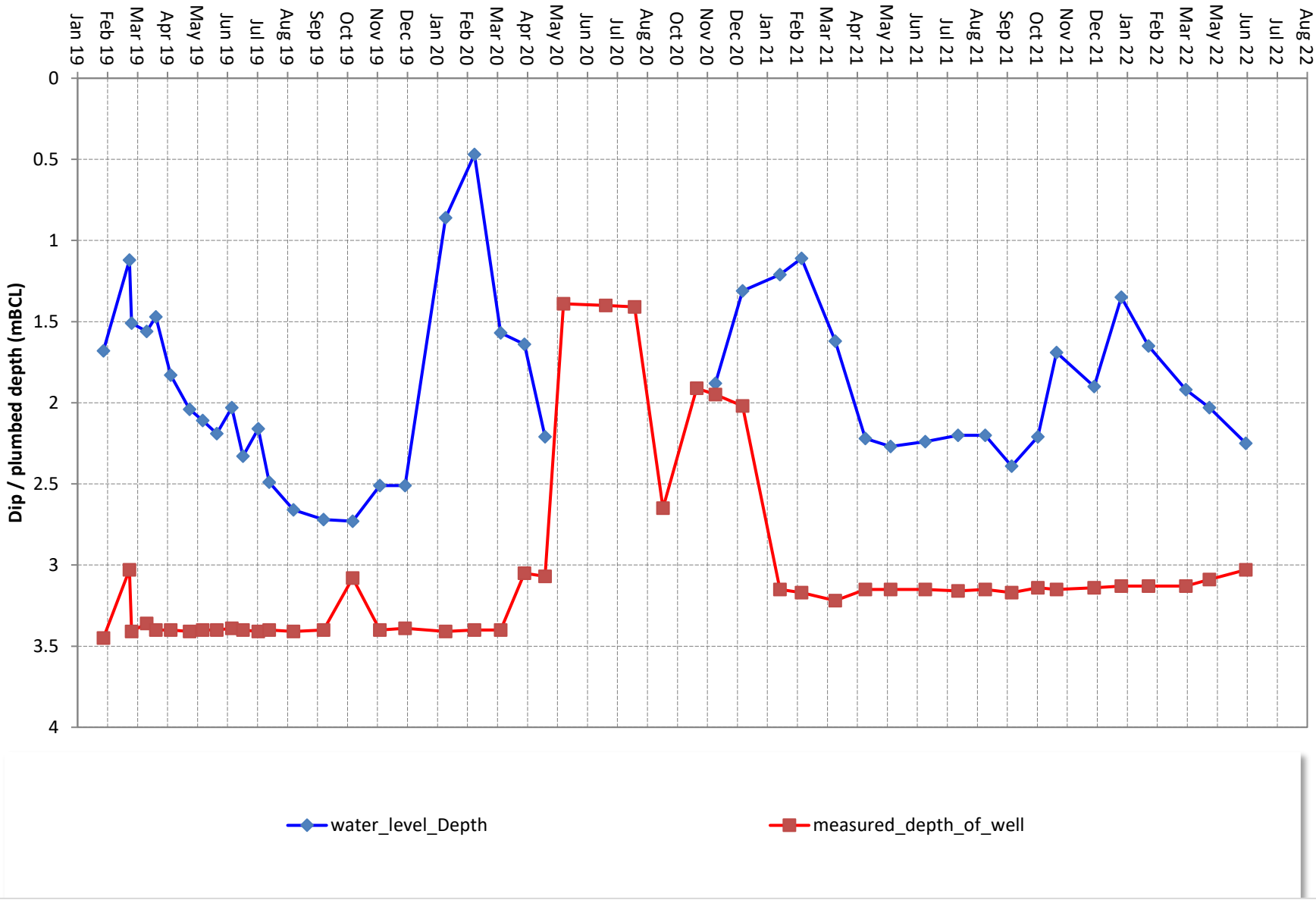
water_level_Depth
measured_depth_of_well

BHC/08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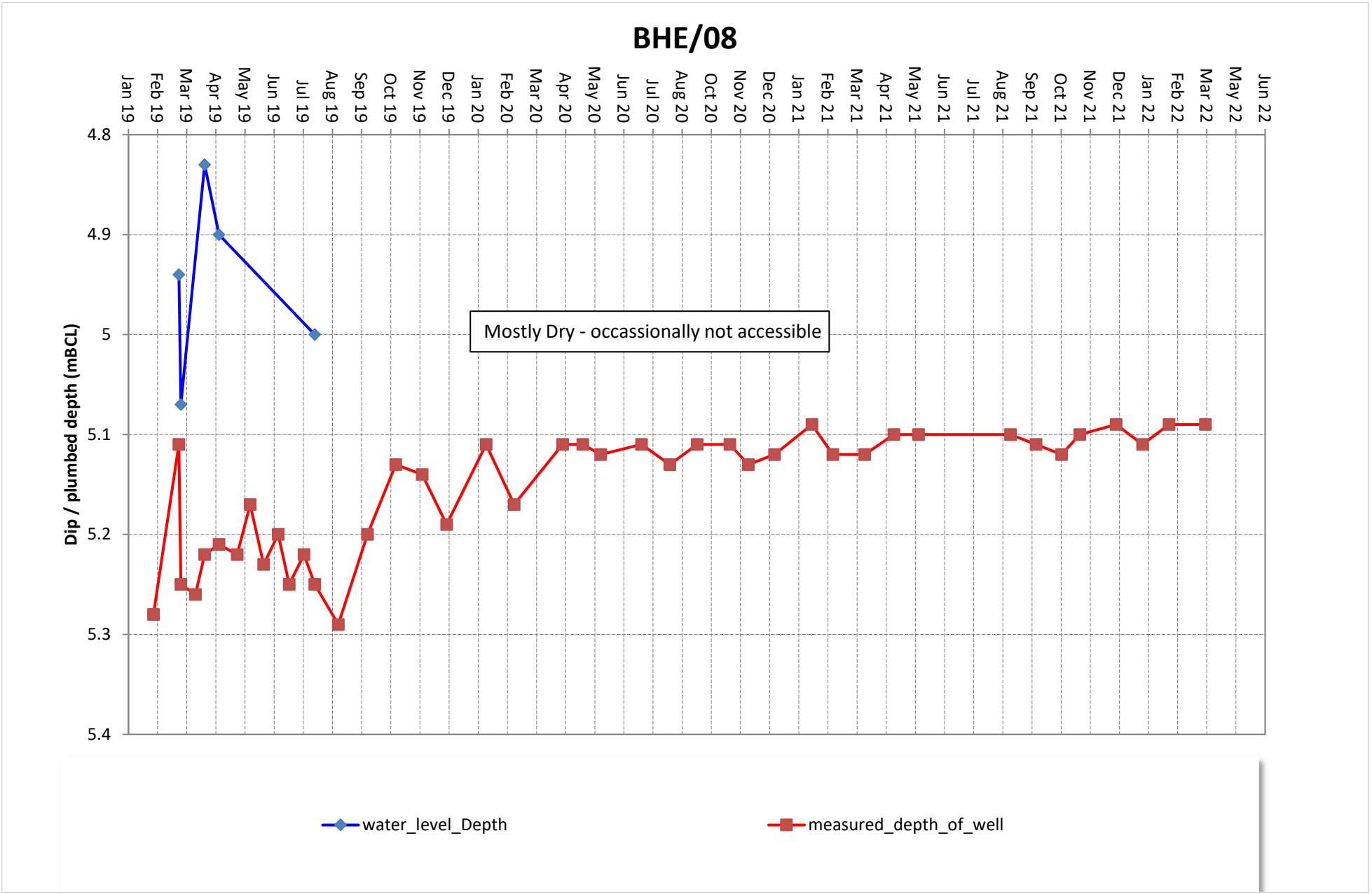
Dip / plumbed depth (mBCL)
water_level_Depth
measured_depth_of_well


BHE/08
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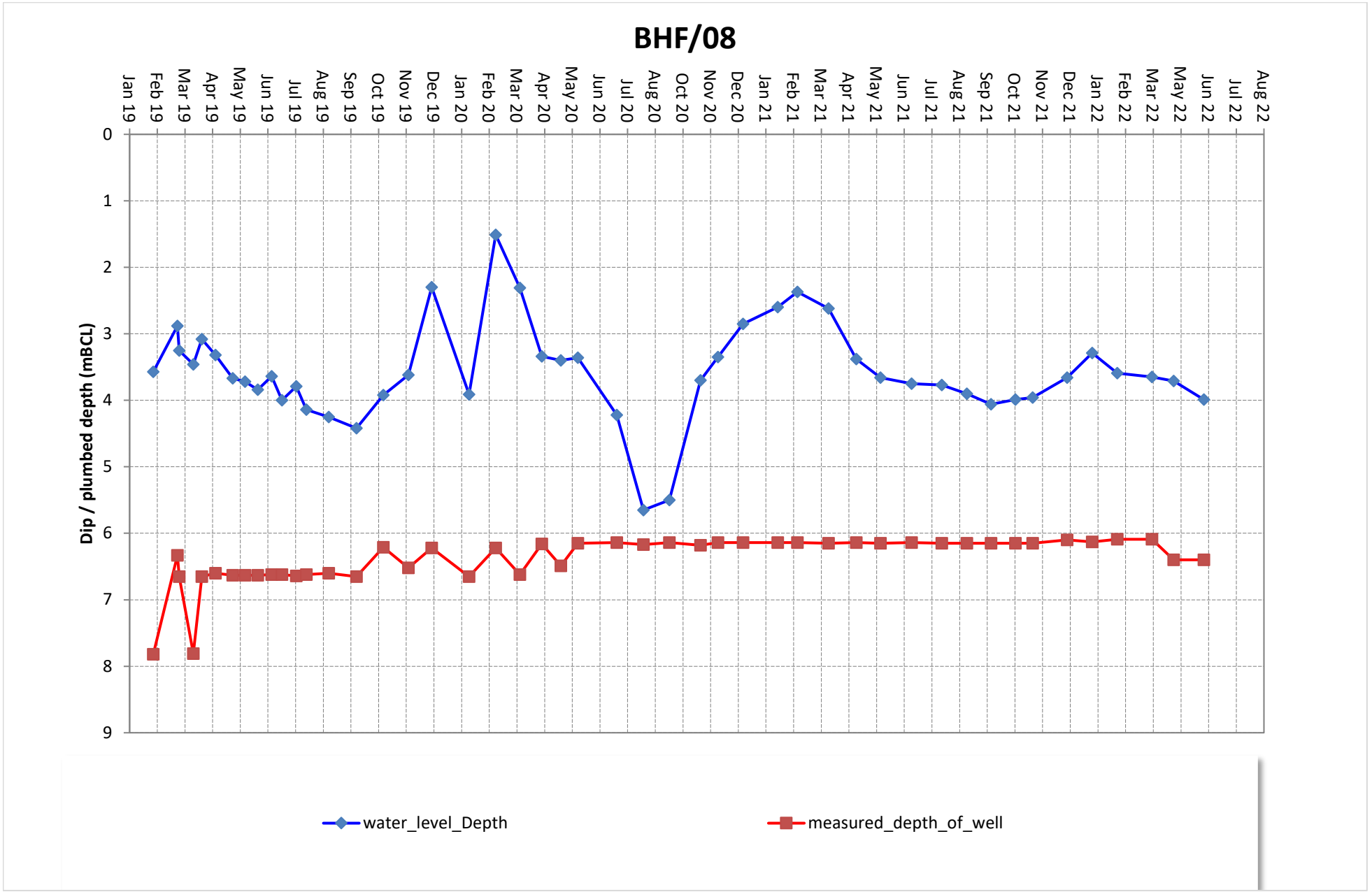
Dip / plumbed depth (mBCL)
Mostly Dry - occassionally not accessible
water_level_Depth
measured_depth_of_well


BHF/08
Dip / plumbed depth (mBCL)
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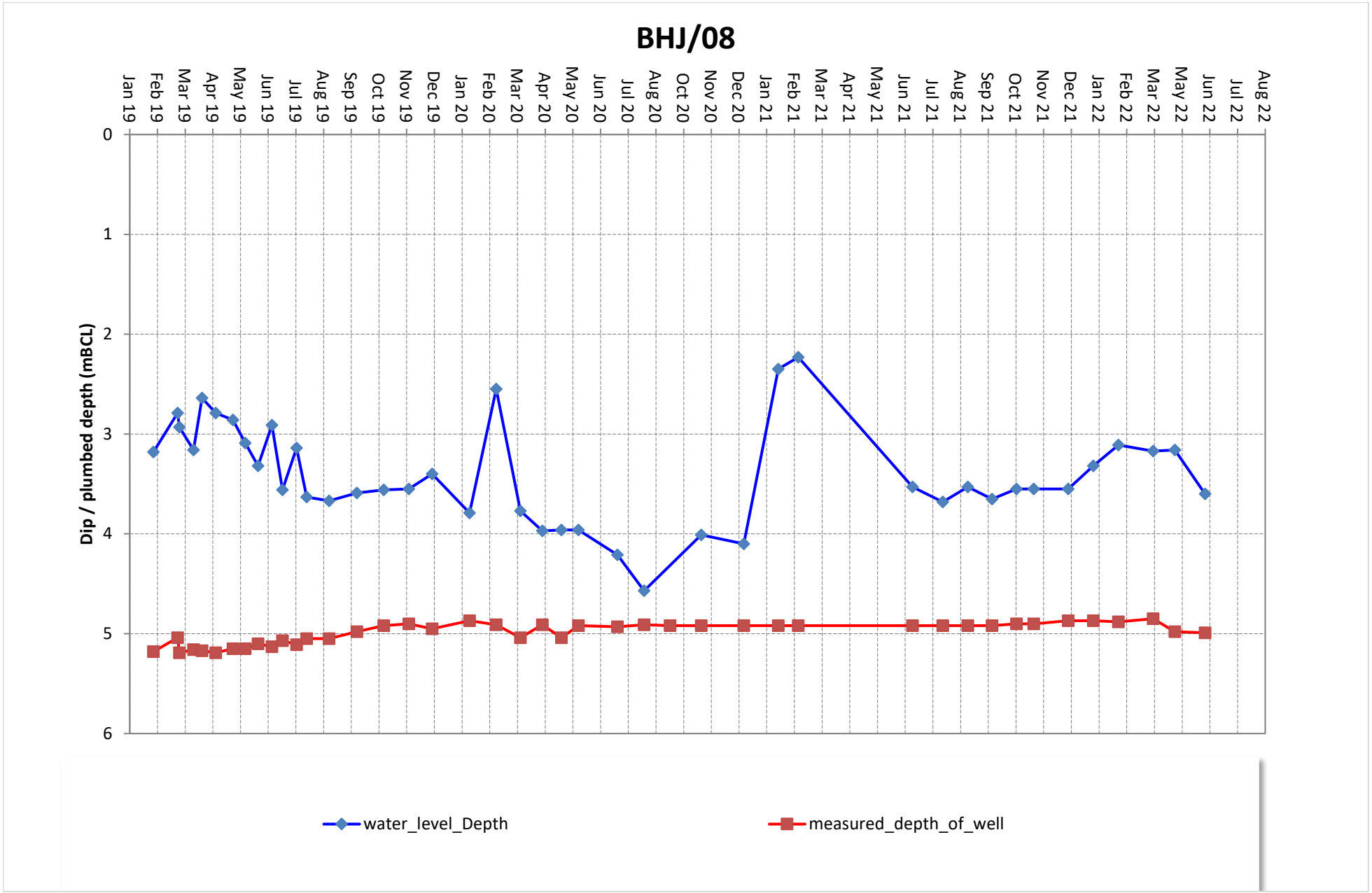
water_level_Depth
measured_depth_of_well


BHJ/08
Dip / plumbed depth (mBCL)
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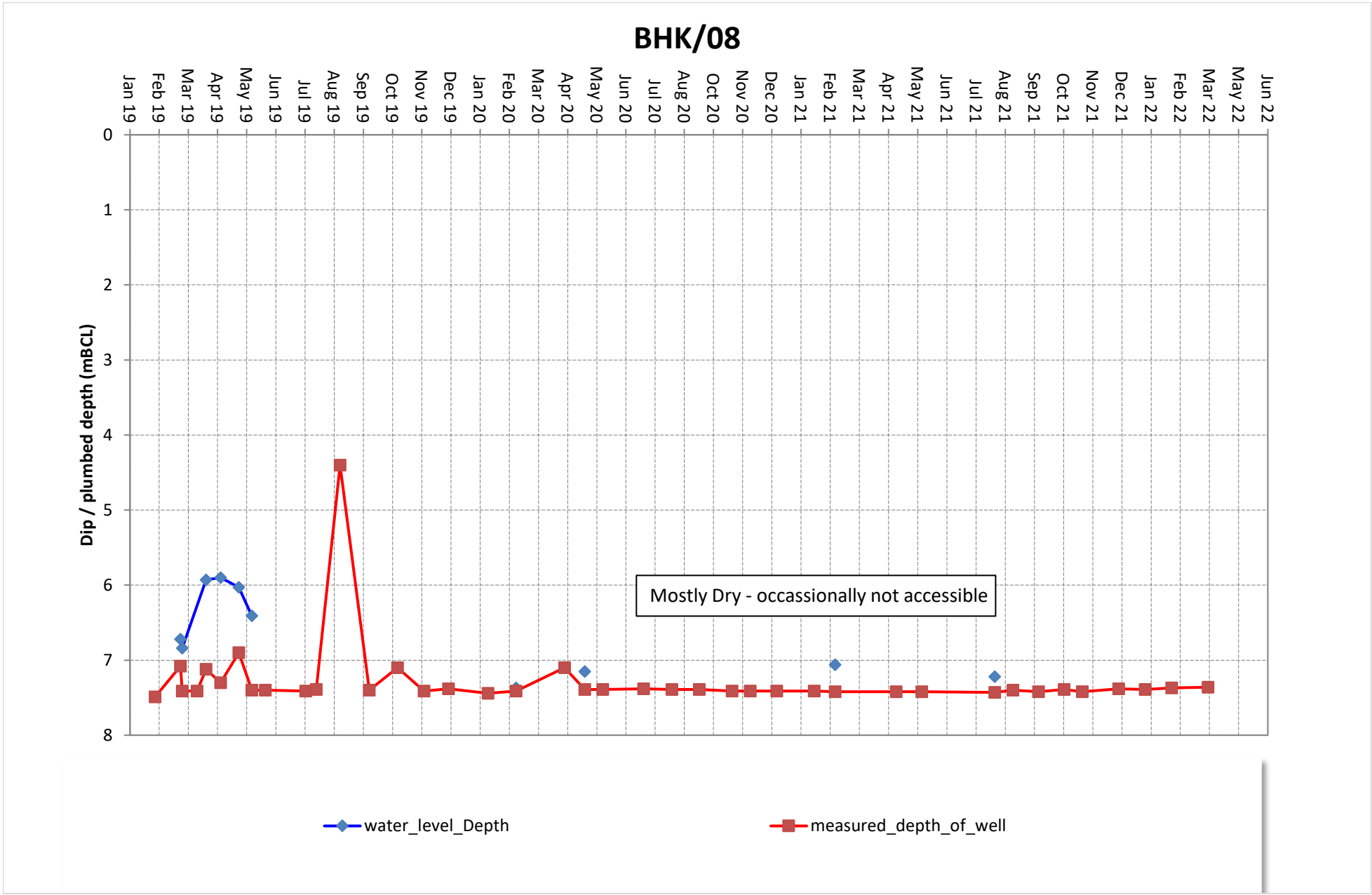
BHK/08
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Dip / plumbed depth (mBCL)
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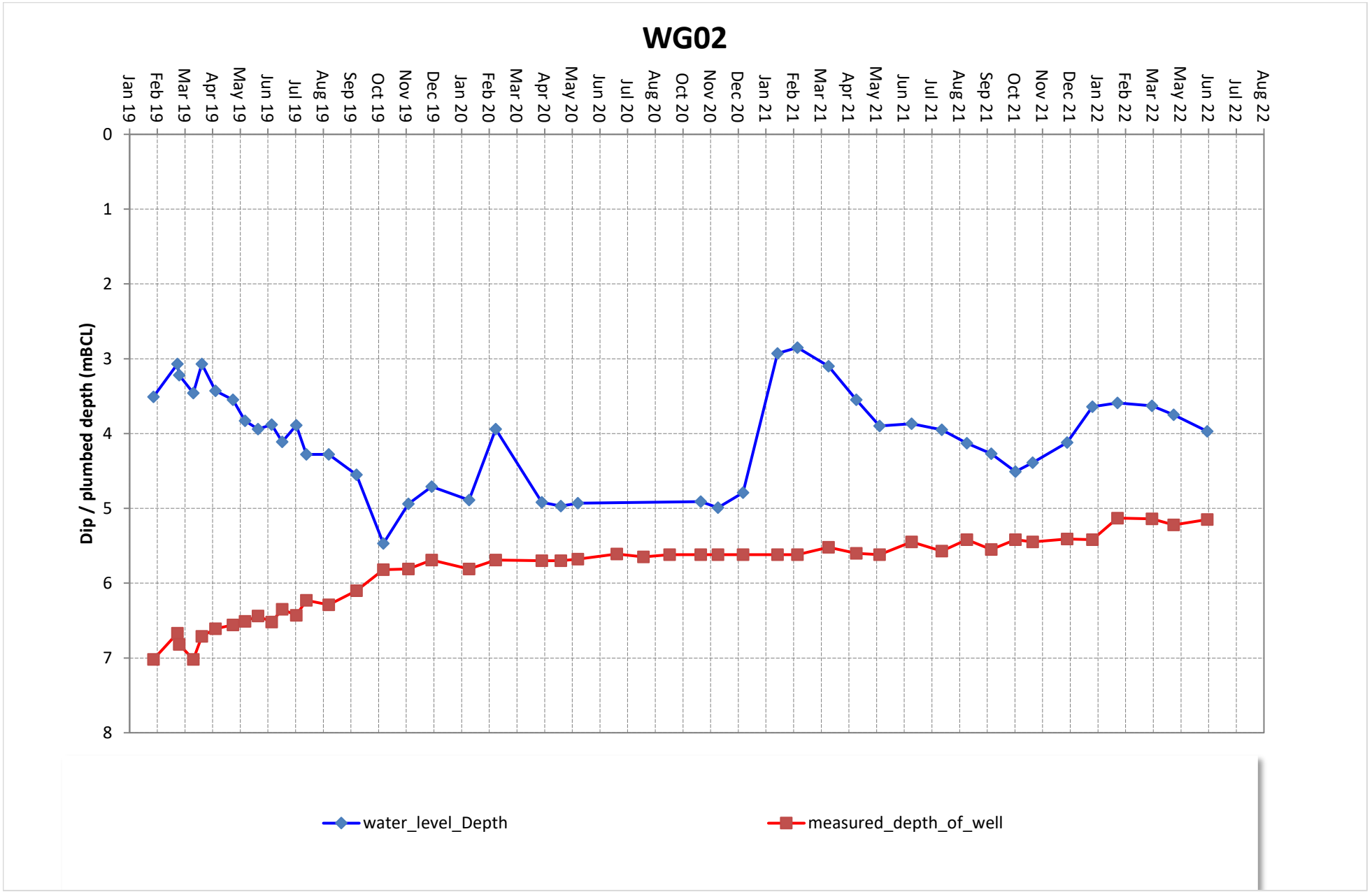
Mostly Dry - occassionally not accessible
water_level_Depth
measured_depth_of_well


WG02
Dip / plumbed depth (mBCL)
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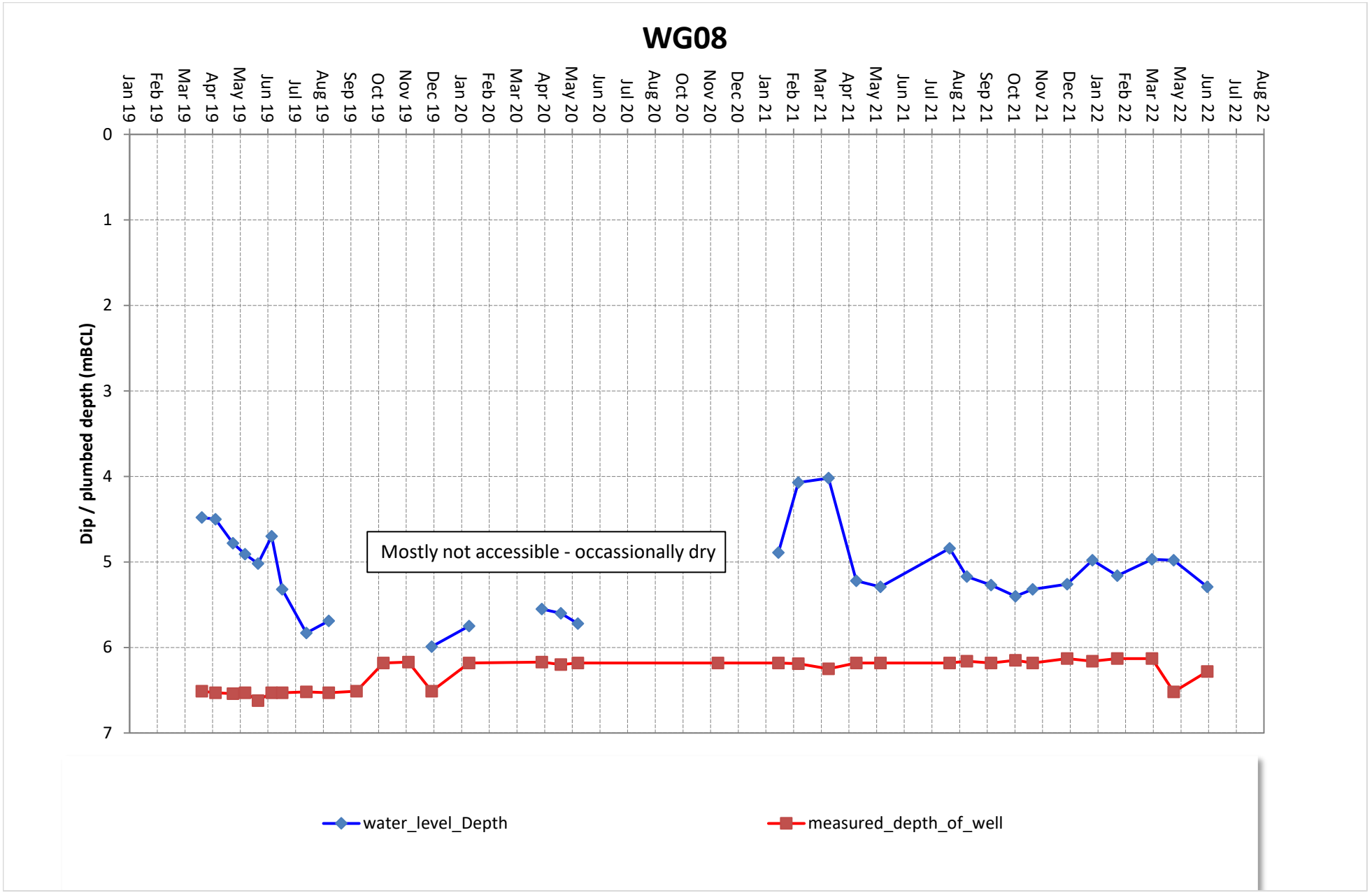
WG08
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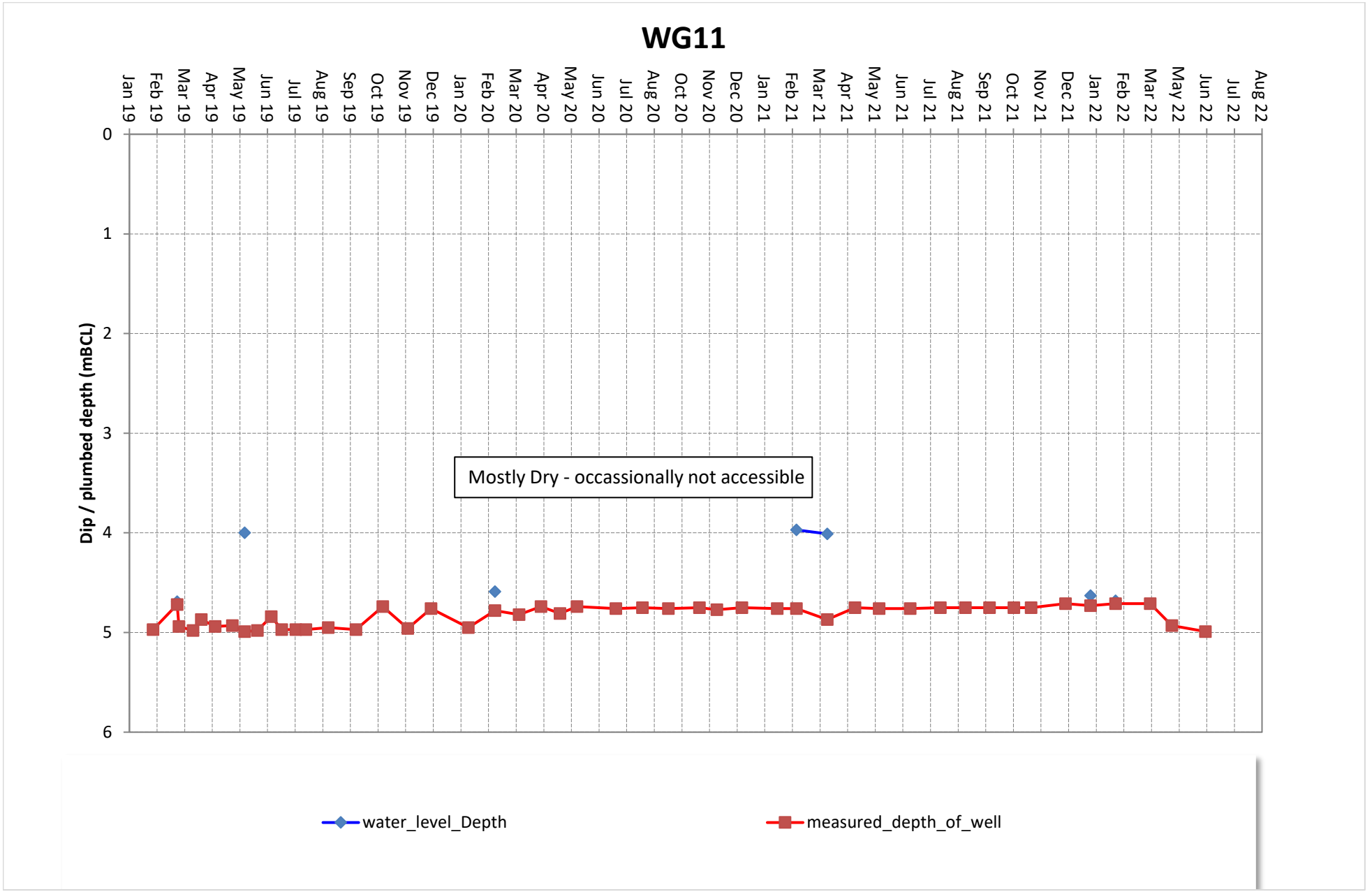
Dip / plumbed depth (mBCL)
Mostly not accessible - occassionally dry
water_level_Depth
measured_depth_of_well


WG11
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Dip / plumbed depth (mBCL)
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Mostly Dry - occassionally not accessible
water_level_Depth
measured_depth_of_well