



Electronic Data Collection: Protecting Yourself

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Introduction

- Initialisation of monitoring
 - Often bespoke conditions to consider
- 3 basic monitoring types for:
 - Quarry discharges (flow and composition)
 - Natural surface water flow, chemistry and ecology
 - Groundwater level
- Objectives
- Field installation
- Logging frequency
- Survey



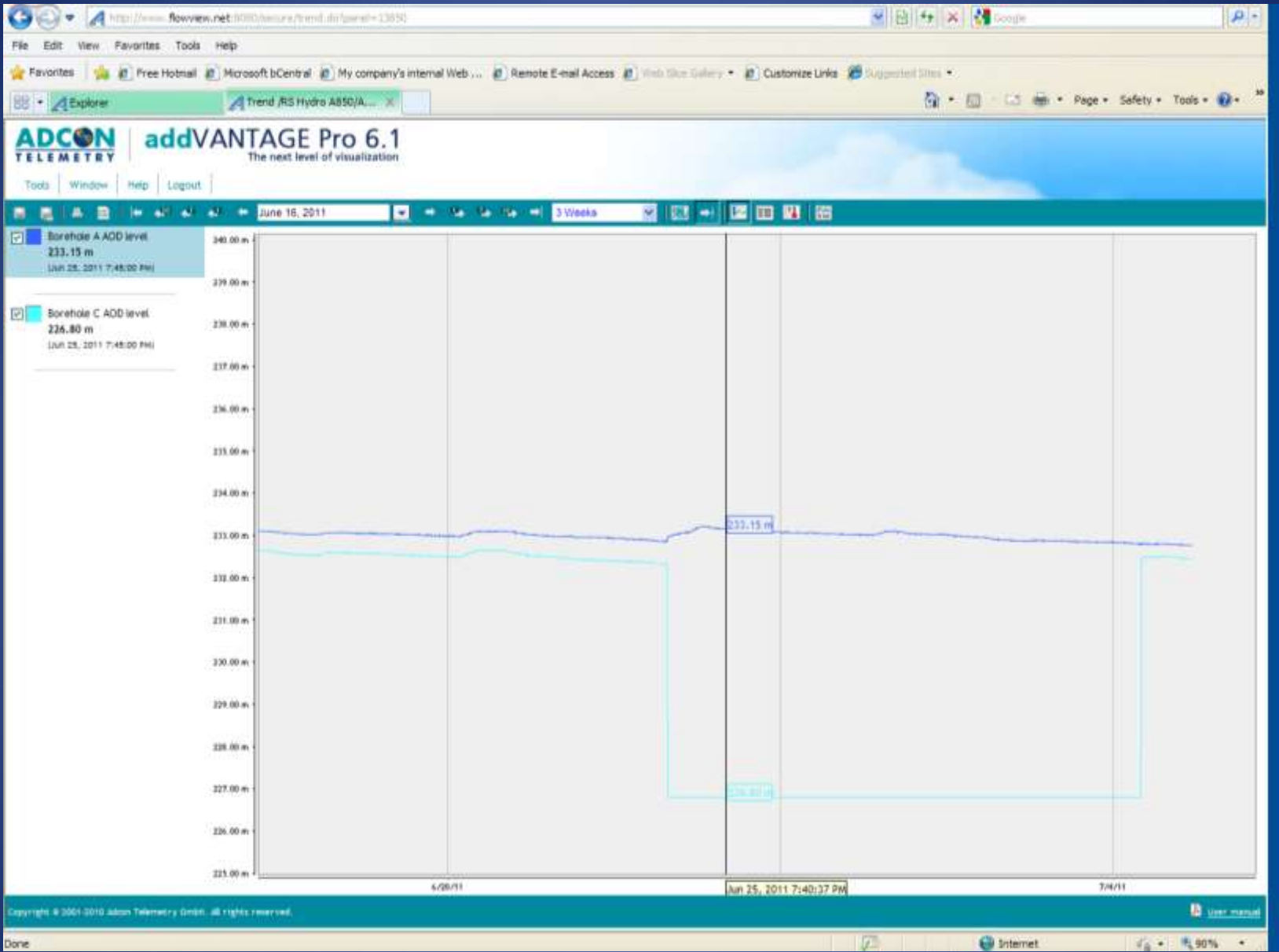
Objectives

- What is the driver for the monitoring?
 - Discharge Regulatory Compliance
 - MCerts accredited
 - Data simply says whether compliant or not
 - Scientific (to support HIA)
 - Appropriate monitoring
 - Base conditions
 - Ease of post processing
 - Appropriate analysis of data



Field Installation

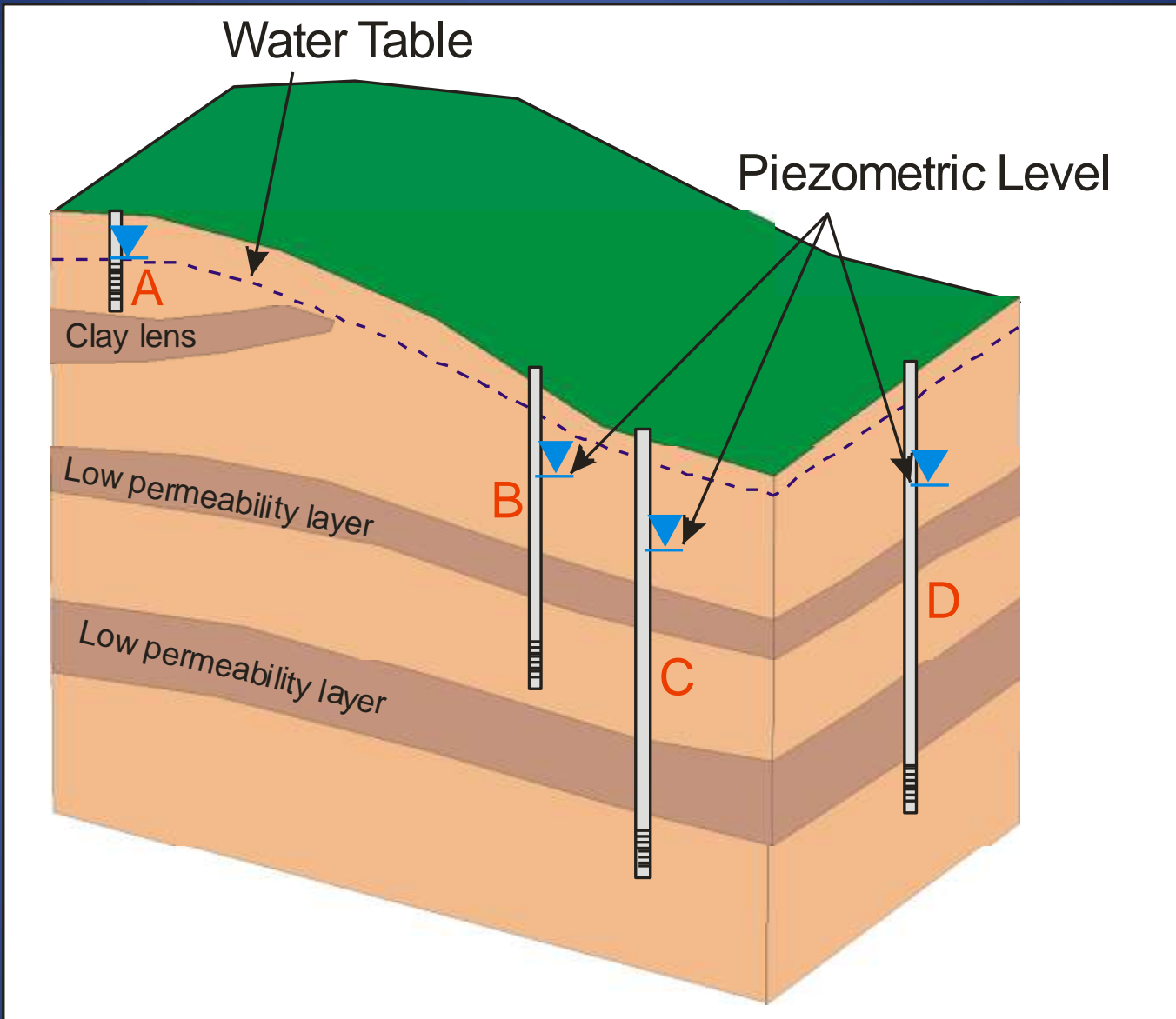
- Temporary or permanent?
- What are we monitoring?
 - Particular horizons, targeted monitoring, min – max of flows, interested in storm flows or low flows
- MCerts and appropriate discharge monitoring
- With or without telemetry?
 - Long or short term
 - Security
 - Data access
- Accurate installation records

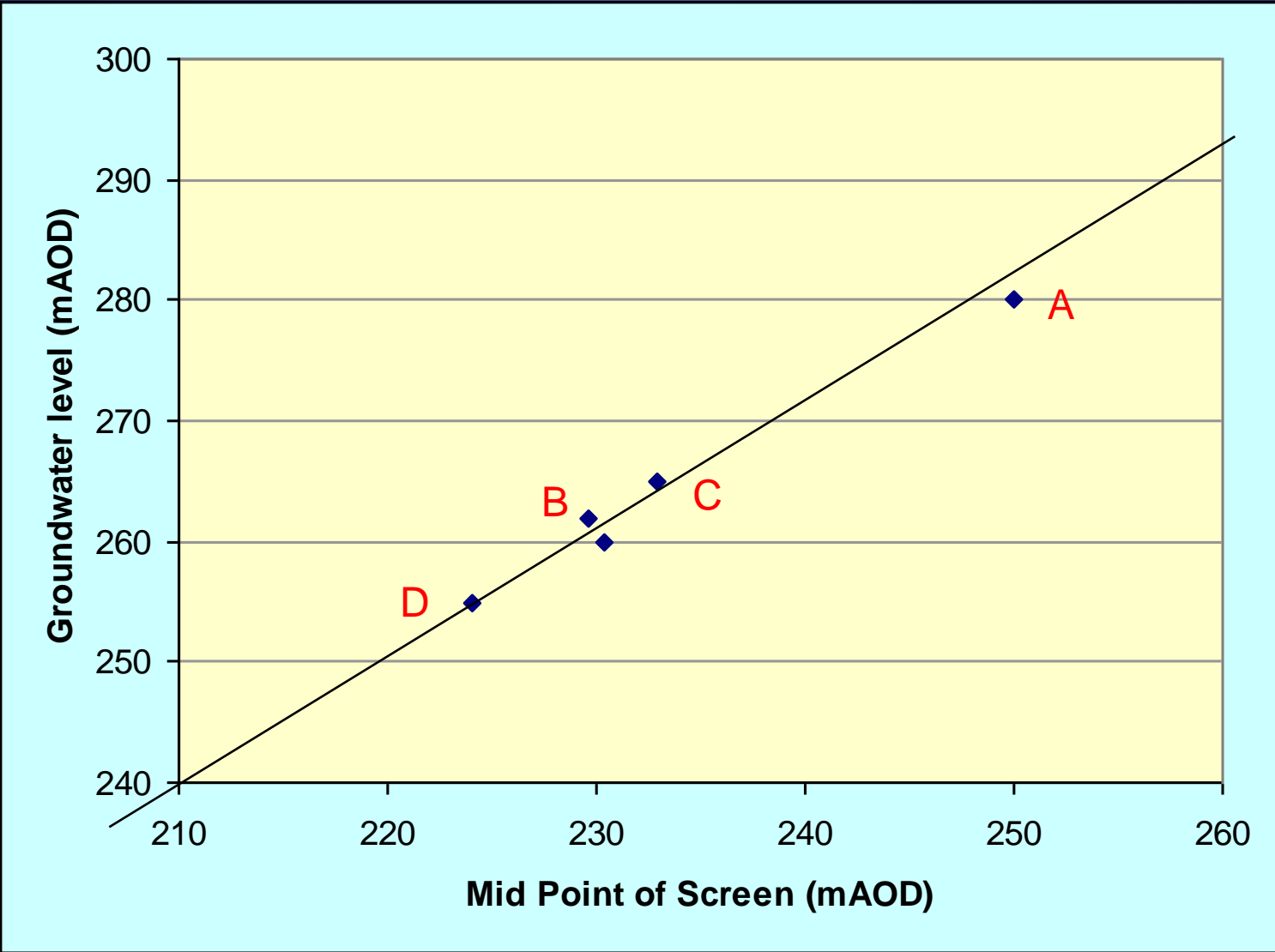


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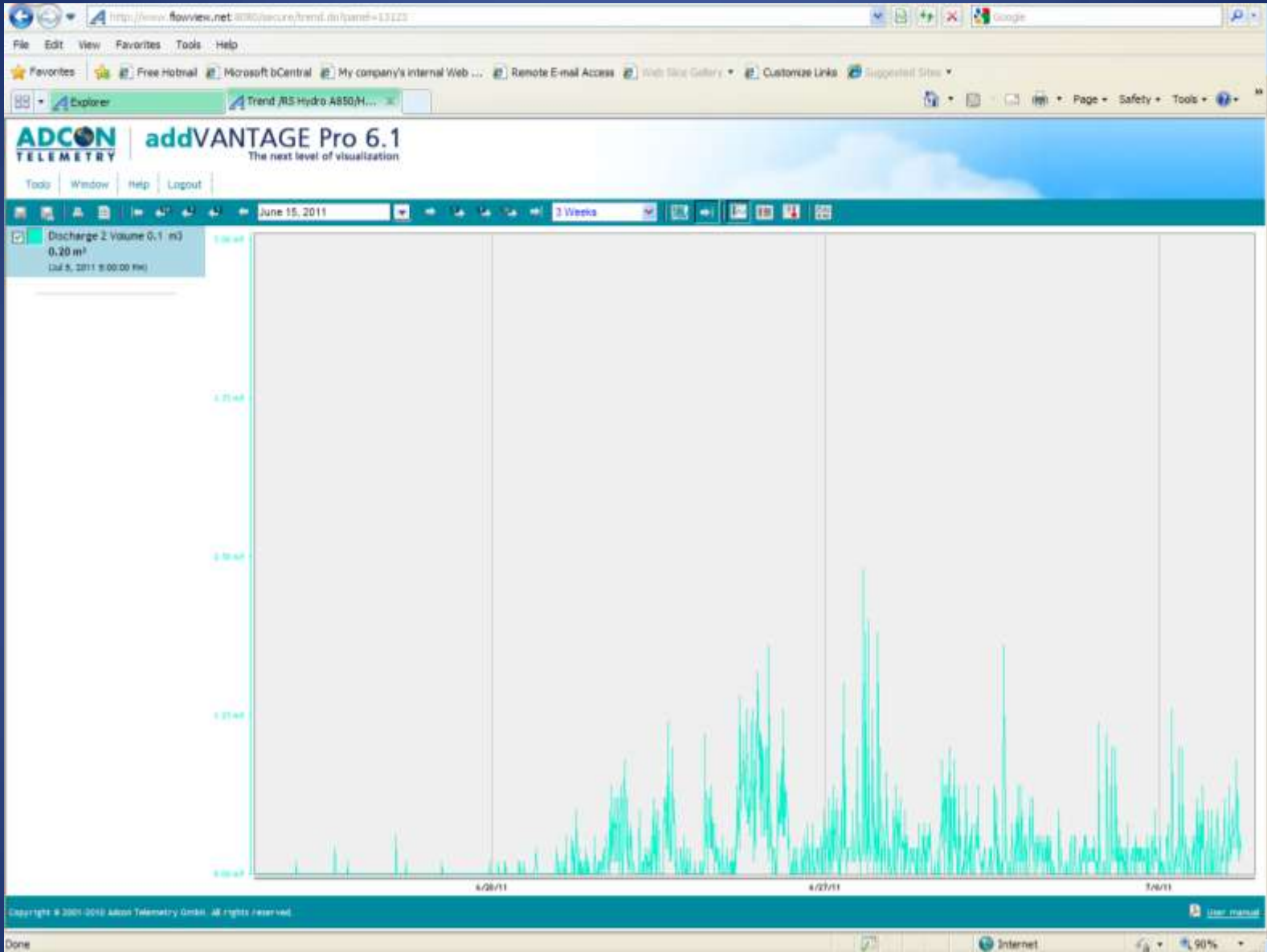






Logging Frequency

- Decision on 15min, hourly, daily, monthly data collection
- Regulated discharge – modern consents
 - Non regulated discharge - transfer licensing?
 - Storm runoff and attenuation of peak flows.
 - GW level data
 - Daily data will suffice
 - Minimum of 3 points for monthly
 - Can accommodate monthly data but!
 - Analysis of stream flows
 - For GW/SW interaction,
 - 15 min SW; 6 points per day GW
 - Time constraints
 - Short time to make conclusions = high resolution of data all round
 - Long term data analysis = potentially lower resolution



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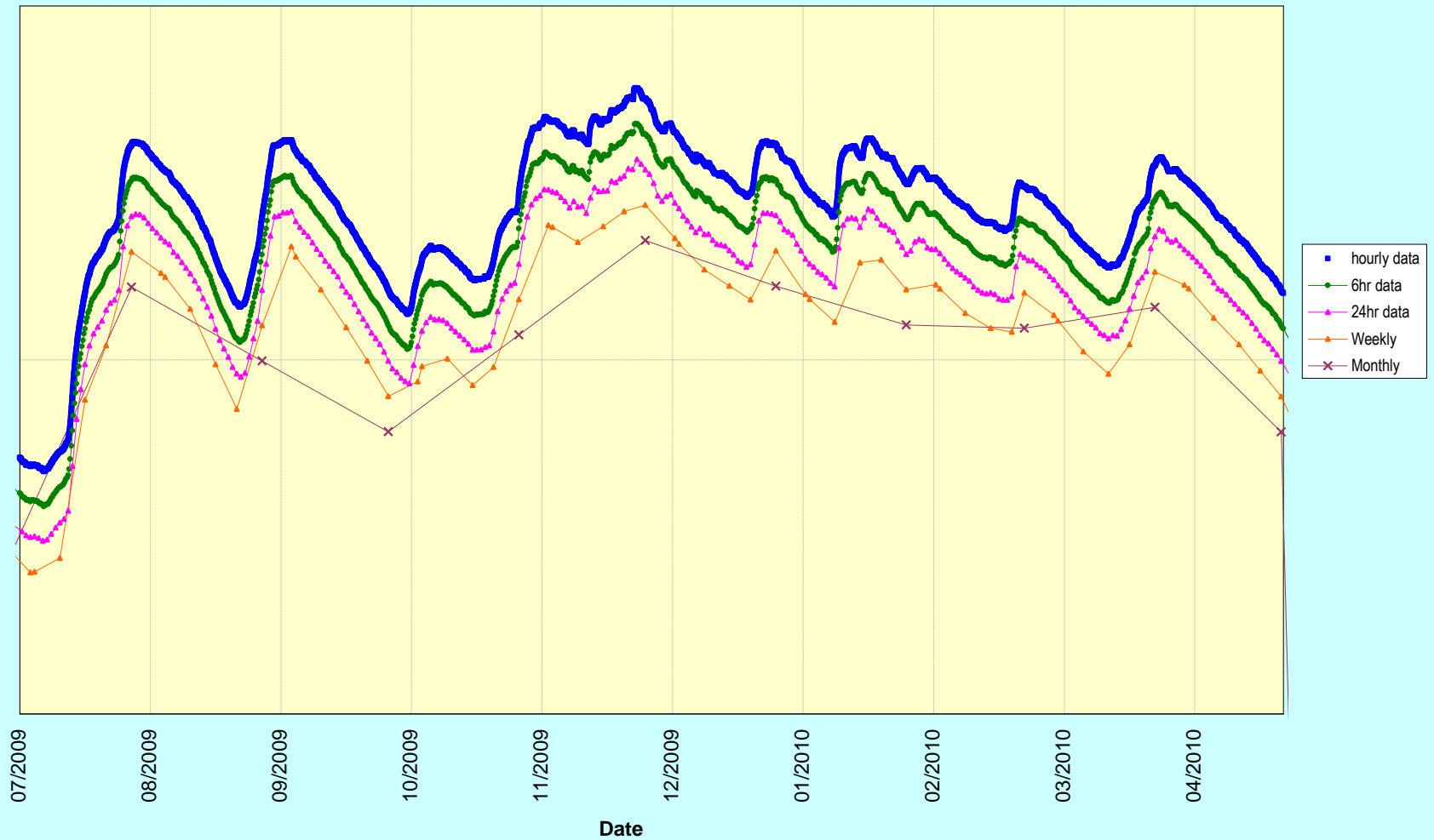
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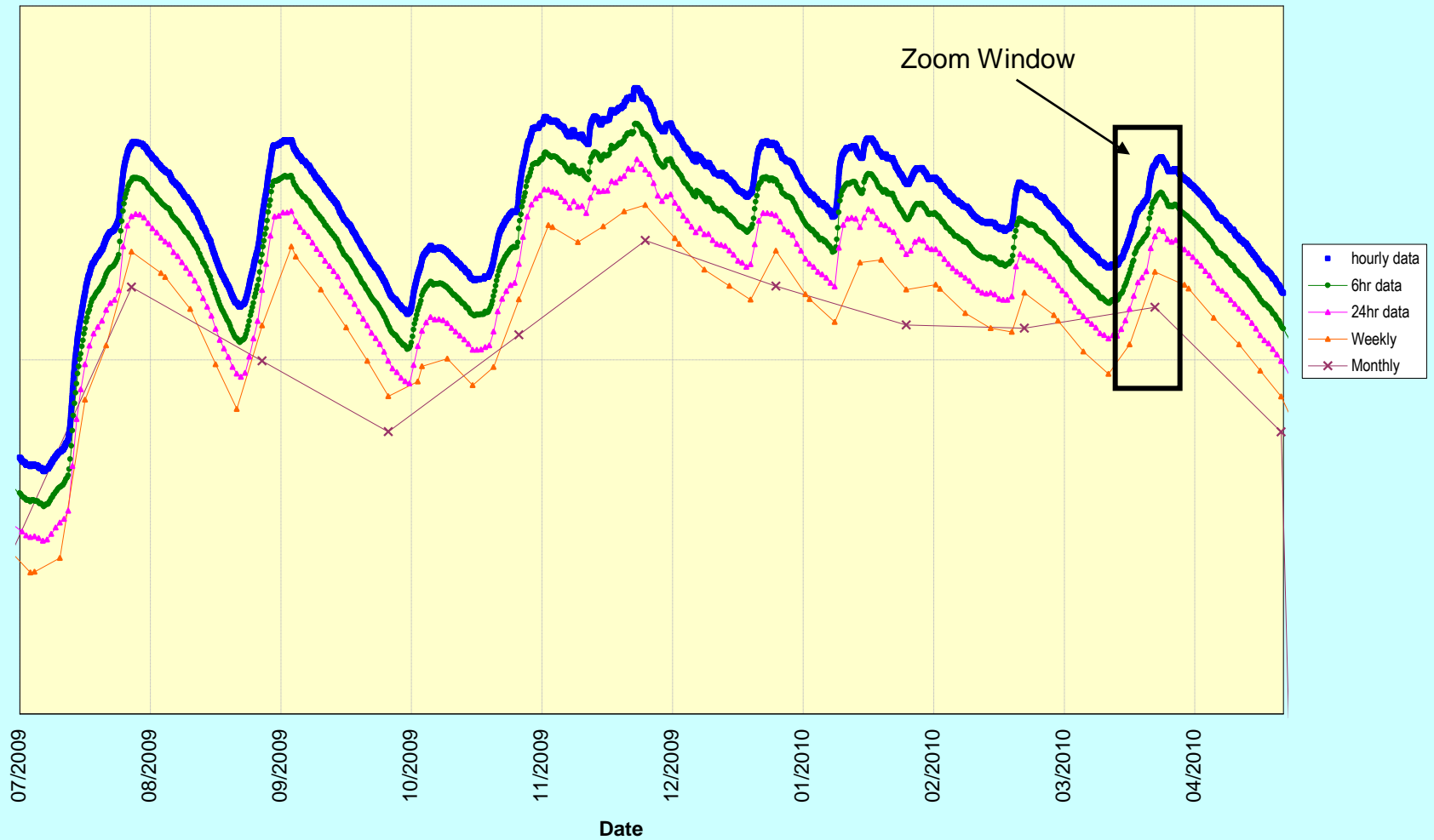
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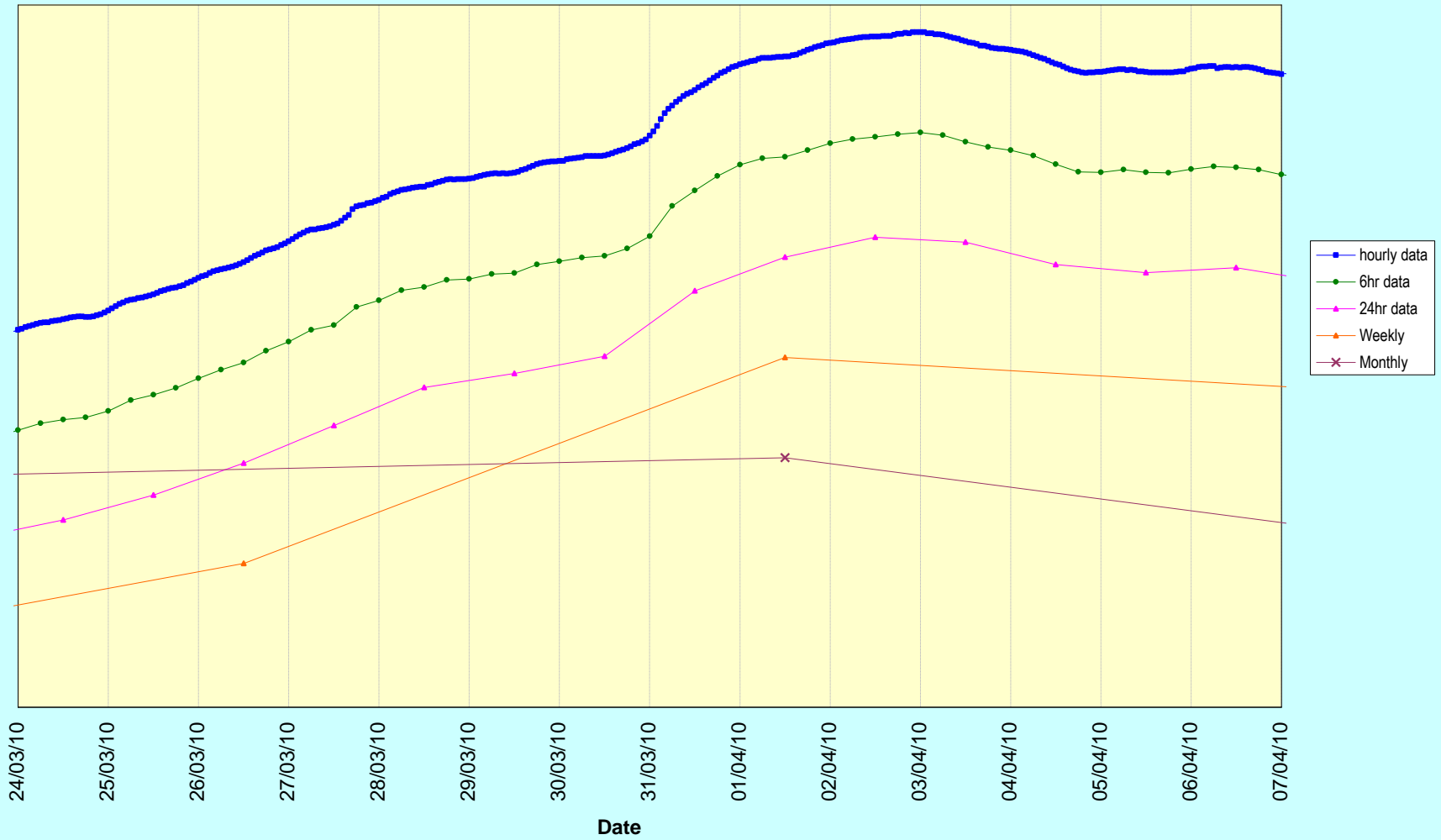
Hydrograph Data Sampling Comparison



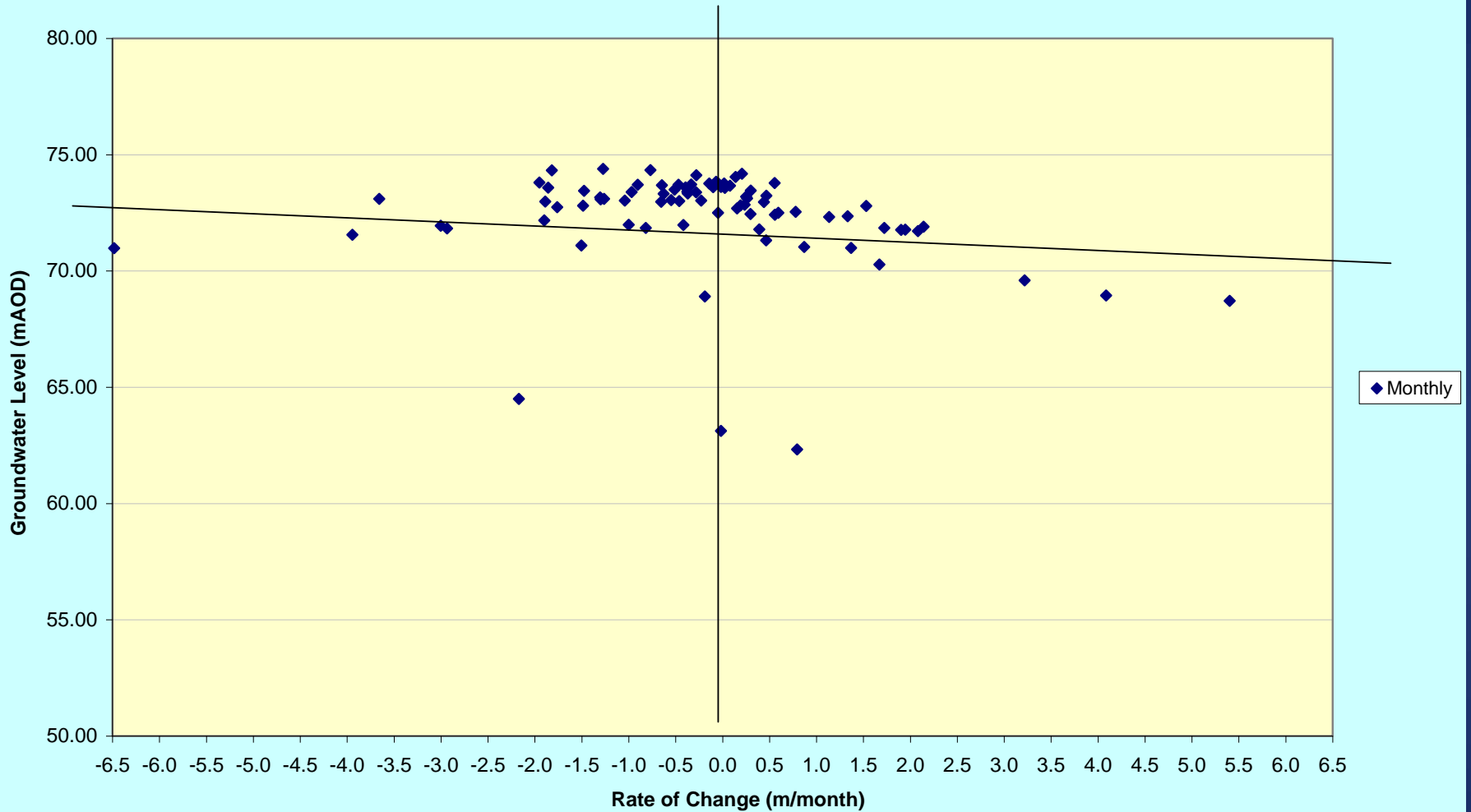
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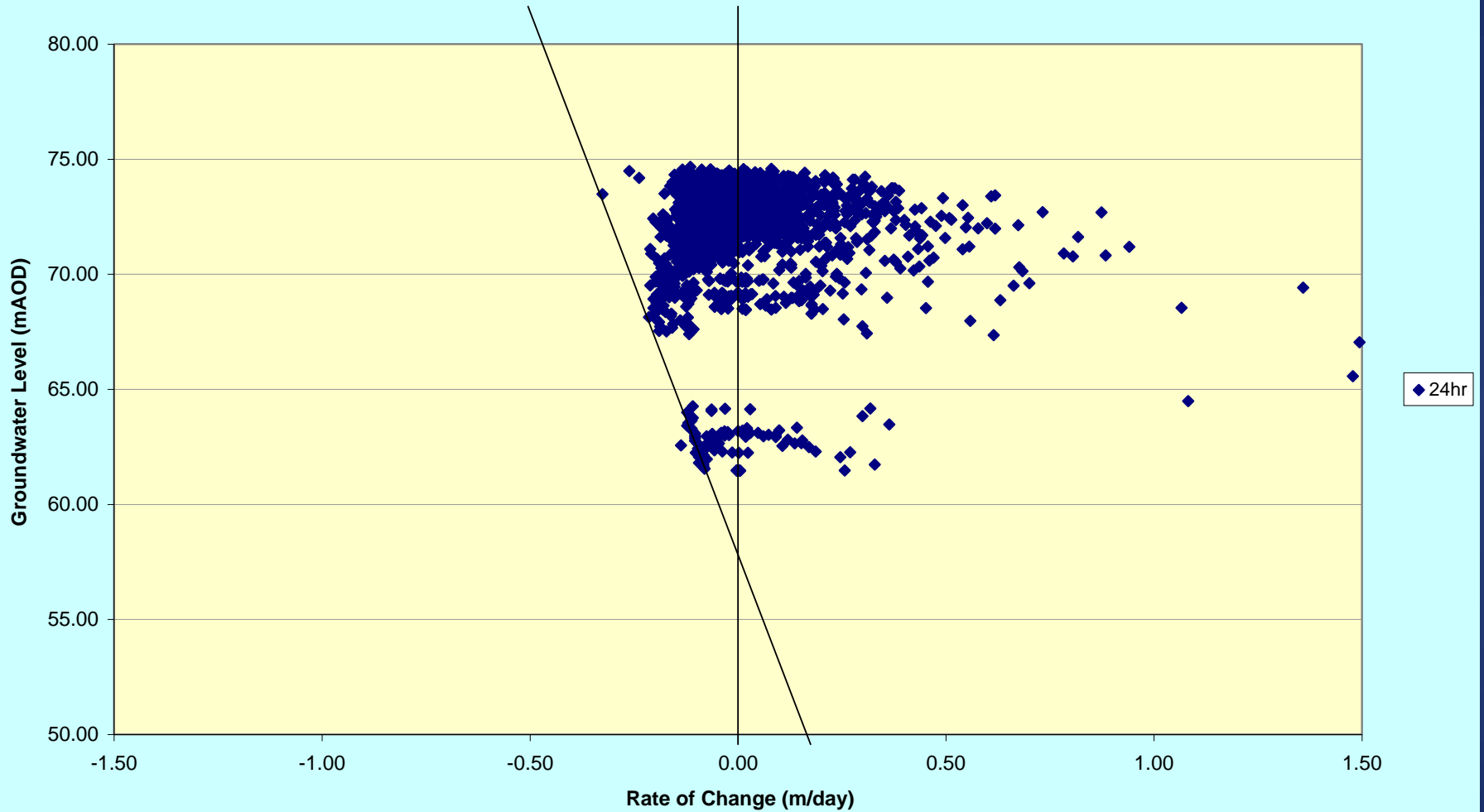
Hydrograph Data Sampling Comparison



Rate of change vrs GW level - Monthly data sampling 2003 - 2010



Rate of change vrs GW level - Daily data sampling 2003 - 2010

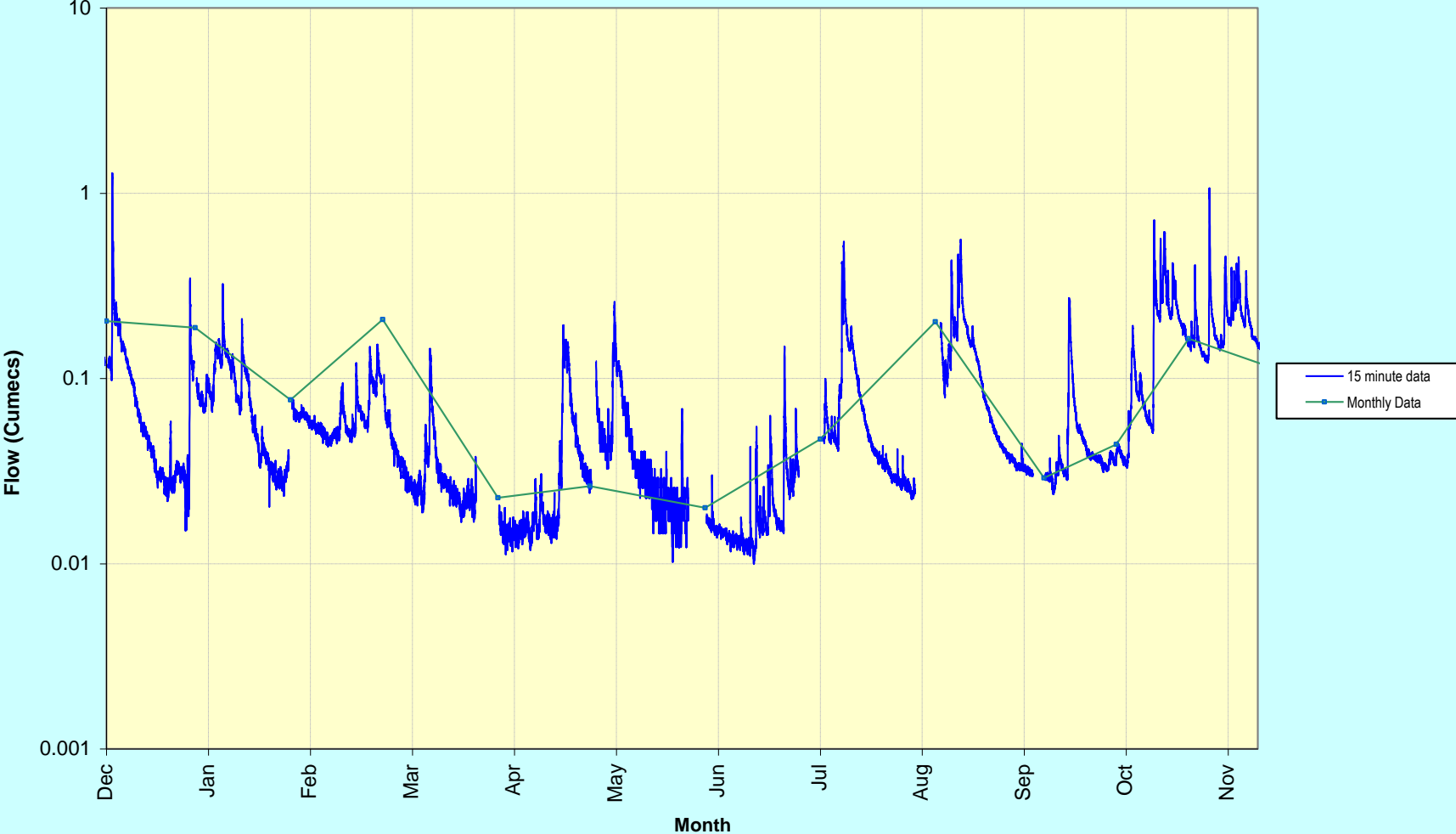


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Monthly data sampling vrs 15 minute data sampling - Surface water flows





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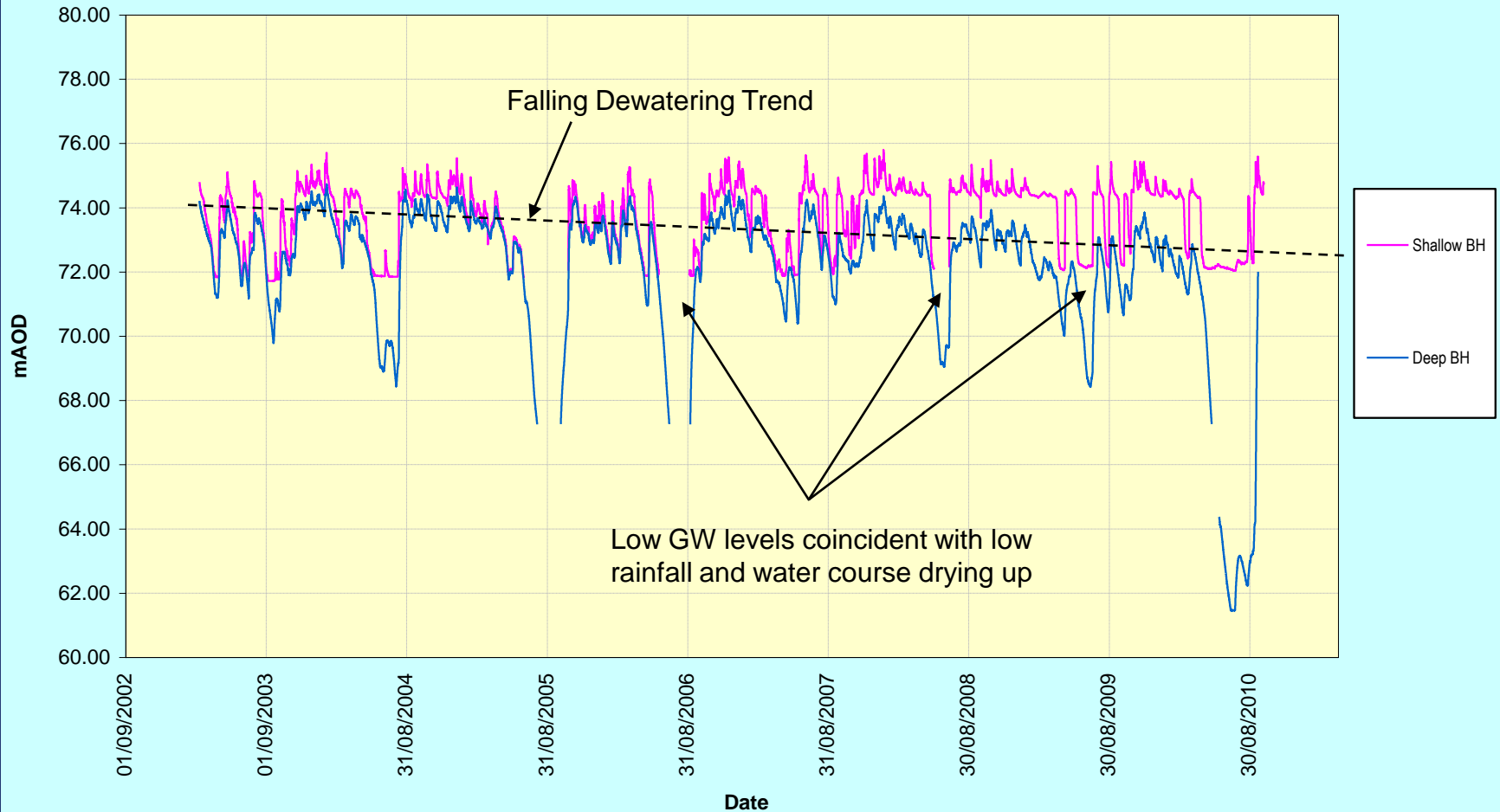
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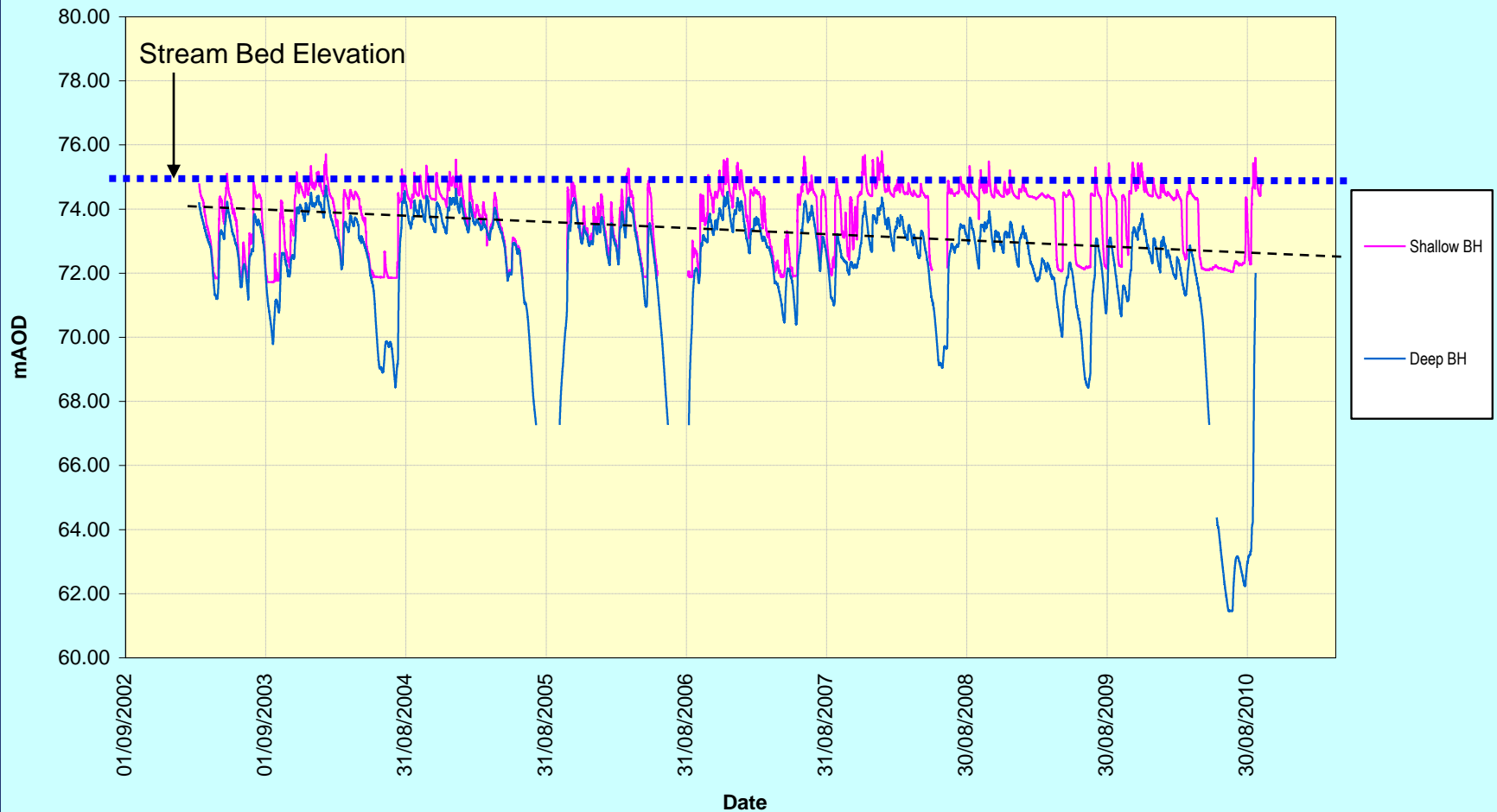
Survey

- Data needs to be related to mAOD
- Comprehensive Survey
 - Monitoring locations and positions
 - Ground elevations of BH's
 - Stage levels
 - Stream beds and all relevant items local to point of interest
- Particularly important for assessment of GW/SW interaction

Hydrograph of shallow and deep boreholes located close to watercourse - Hourly Data from 2002 to 2010



Hydrograph of shallow and deep boreholes located close to watercourse - Hourly Data from 2002 to 2010



Summary

- Conditions & objectives are bespoke to the quarry
 - ✓ 15 minute or daily data collection
 - ✗ Monthly data collection often not appropriate but better than nothing!
- Telemetry or not?
- *If we want to have a good understanding of the “system” that provides protection re. regulation, prosecution or impacts it is important that we have good data gathering and management.*



Any Questions?

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