

Critical Analysis for Groundwater Monitoring Network Optimization



Client

Fatos

Chemical

Ponto

1998 - 2020

Pais

Brazil

The study comprises a critical analysis of a groundwater monitoring network aiming at increasing environmental management efficiency by optimizing the analytical monitoring process considering monitoring wells representativeness, sampling frequency, and analytical scope.

The area of concern has a monitoring network consisting of 210 wells, covering an area of 150;000 m² where industrial operations took place from the period of 1921 until 2015.

There is an extensive history of investigations and groundwater monitoring campaigns, which altogether enabled the development and refinement of the local environmental knowledge.

Based on technical knowledge and existing data, this study comprised a critical analysis aiming at optimizing the groundwater monitoring process, considering the representativeness of the existing wells, sampling frequency, and analytical scope, so that increasing the environmental management efficiency.

The study methodology consisted of the use of the following approaches:

- Descriptive statistics
- Temporal correlation analysis
- Qualitative spatial analysis
- Chemical of concern evaluation
- Mann-Kendall analysis

Also, the critical analyses considered a site-specific approach based on the following premises:

- Sampling period;
- Geology/Hydrogeology;
- Maintenance or removal of monitoring wells
- Sampling frequency optimization
- Maximum contaminant level;

Therefore, a decision-making flowchart based on the described methodology and premises were applied to support the development of the study.



As a result, the critical analysis made the monitoring process optimization possible without lowering the quality of the data, so that allowing a more focused interpretation and consequently increasing the site management’s efficiency. Graphs 1 and 2 show as a result a comparison among current and proposed quantitative for the monitoring process



Gráfico 1 – Comparativo entre rede de monitoramento atual x proposta

continuation.



Gráfico 2 – Comparativo entre escopo analítico atual X proposto

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