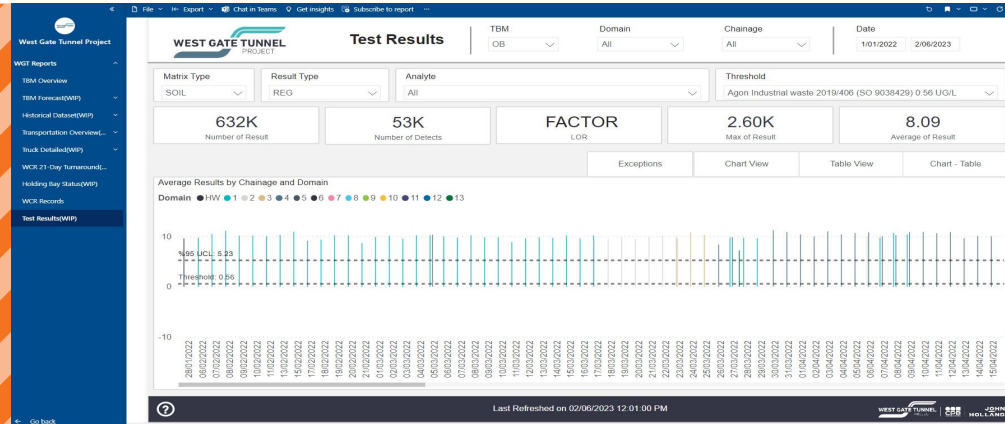


MOTHER HUB FOR TUNNEL SPOIL DATA MANAGEMENT

A centralised data hub called “Mother Hub” provided West Gate Tunnel Project a streamlined tunnel spoil data collection and analysis process enabling early intervention to emerging issues.

Mother Hub provides stakeholders with a streamlined tunnel spoil data collection and analysis process with results entered directly into the database by the laboratory.

Automated dashboards and alarms set at action levels below human health exposure criteria, enabled targeted data monitoring, providing assurance for the workgroup and a platform for early intervention to an emerging issue.



Mother Hub human health exposure criteria .

The Situation

The composition of the soil along the tunnel alignment was analysed prior to the commencement of tunnelling, through bore hole and groundwater samples, to indicate potential contaminants of concerns. A range of contaminants were identified, consistent with historic land use, including PFAS, hydrocarbons and naturally occurring chromium. Whilst the sample data indicated levels below human health impact thresholds, an analysis of spoil generated by the Tunnel Boring Machines was required to confirm realised contaminant values.

Traditional spoil management processes involving paper or electronic records did not provide the agility of timely results and traceability, for swift and appropriate management of risk. The scale of the tunnelling activity required a database to support tracking of more than 9000 samples of tunnel spoil, beyond the capability of commercially available database options.

The Solution

A centralised data hub called “Mother Hub” was developed to monitor spoil analysis data from tunnelling activities and maps against historical ground water and soil monitoring data through a human health dashboard. The automated dashboards provide intelligent reporting, with action level alarms set at 25%, 50%, 75% and 100% of human health exposure criteria. This enables regular data monitoring to provide assurance to the workgroup and for triggering early intervention responses to emerging human health issues.

Automated alarms ensure mitigating action was taken before values approached half the nominated thresholds.

During cross passage construction, access to data enabled internal and independent occupational hygienists to review contaminant data prior to the removal of a tunnel segment, allowing appropriate controls to be implemented.

Benefits and learnings

Mother Hub is an automated system that reduces data management errors whilst enhancing end user functionality. The Mother Hub successfully tracked and managed the tunnel spoil dataset from cradle to grave and provided enhanced capability for multiple disciplines. Access to data was tailored according to the specific needs of those stakeholders and associated data security requirements.

Realised data could be mapped together and presented to identify emerging risks. Alerts were activated when predetermined trigger levels were breached. Trigger levels were set to allow for investigations to occur and the emerging issue identified and assessed, prior to there being a risk of exposure to a human health hazard.

Cost Benefit

The Mother Hub was effective and efficient. It eliminated double handling of data, and provided Stakeholders with a single source of information.

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