Terra Firma™

Odour Covers
Case Study

Project Highlight:

Bendigo Water Reclamation Plant Inlet Covers and Odour Sealing Upgrade

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Project Background

Coliban Water provides water and wastewater services to more than 130,000 customers across 16,500 square kilometres of central and northern Victoria. The Bendigo Water Reclamation Plant (WRP) at Epsom is the largest facility in the region, receiving sewage via gravity from surrounding areas and through pumping stations from lower-altitude catchments. At the inlet structure, flows undergo screening and grit removal before entering the treatment process.

Within ten years after a standard FRP cover system was installed on the inlet structure walkways, severe structural deterioration was identified. The covers showed significant cracking and material breakdown, creating a serious safety risk. This degradation was caused by the highly aggressive environment, with elevated concentrations of hydrogen sulphide and other corrosive gases. Simultaneously, odour emissions had become a pressing issue.

The treatment plant was under intense pressure from both the Environmental Protection Authority (EPA) and local residents due to increasing odour levels and numerous community complaints. Independent testing confirmed the severity of the issue, with an Odour Emission Rate (OER) measured at 132,300 OU·m³/s. Key pollutants included ammonia at 70 mg/m³, hydrogen sulphide at 36 mg/m³, methyl mercaptan at 110 mg/m³, dimethyl sulphide at 36 mg/m³, and total VOCs at 4,400 mg/m³.

Access to the inlet structure had become extremely limited due to severe structural deterioration of the existing cover system. This deterioration had escalated the risk of catastrophic failure, significantly increasing workplace health and safety concerns and further restricting safe operational and maintenance activities. Together, these conditions underscored the urgent need for a robust access and odour containment system and a comprehensive structural upgrade to restore safety, ensure environmental compliance, and maintain the plant's continuous operation.

Project Challenges

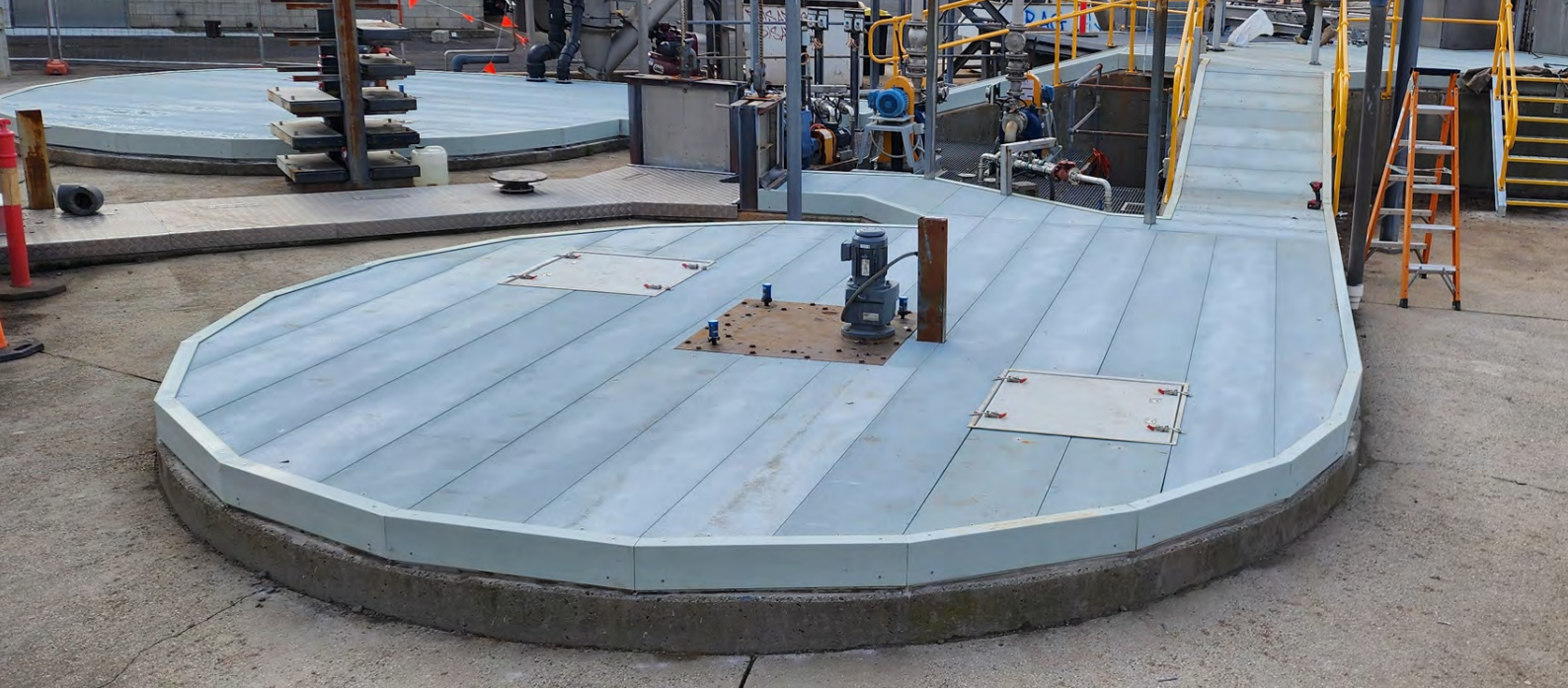
The upgrade works needed to be delivered without interrupting plant operations, as there was no redundancy in the inlet system. This required careful staging and a live sewer management strategy. The existing civil structures, channel walls, and inlet machinery were in poor condition, with uncertain structural integrity. Compounding this was the absence of accurate as-constructed drawings, as the inlet works had undergone numerous undocumented modifications over time.

The harsh operating environment presented further challenges, with extreme toxicity and corrosivity dictating stringent material selection and safety protocols. Achieving a continuous odour seal was also difficult due to the presence of fixed and moving machinery in the inlet structure, requiring innovative sealing solutions that could adapt to irregular geometries.

Innovative Solution

Terra Firma's FRP Access Covers and Odour Sealing System was chosen as the optimal solution. Designed and fabricated in-house, the system was tailored to Coliban Water's operational and environmental needs. Manufactured from vinyl ester FRP, the covers provide exceptional chemical resistance to hydrogen sulphide, VOCs, and other aggressive compounds. Engineered for a 2.5 kPa live load, the covers are fully trafficable, ensuring safe operational and maintenance access.

The lightweight construction reduced load on the deteriorating substructure, eliminating the need for extensive strengthening works. The system's modular design allowed easy on-site modifications, enabling local contractors with no prior industry-specific experience to install it efficiently. Installation was completed within an eight-week window, minimising disruption to daily plant operations and other capital works in the vicinity.



Outcomes and Benefits

The upgraded inlet covers have delivered significant odour reduction, addressing EPA compliance requirements and improving community amenity. The replacement of deteriorated covers has restored structural safety and provided secure access for operational staff. The project avoided costly structural rehabilitation while delivering a durable, low-maintenance solution with a long service life.

By combining innovative product design, corrosion-resistant materials, and flexible installation methods, Coliban Water achieved a high-performance odour containment system that supports operational continuity and environmental goals.

Conclusion

The Bendigo WRP inlet cover and odour sealing upgrade demonstrates how targeted engineering solutions can address both technical and environmental challenges in wastewater treatment infrastructure. Terra Firma's FRP cover system has provided Coliban Water with a future-ready asset, offering extended service life, improved operational safety, and measurable environmental benefits. This project serves as a strong example for other municipal water authorities seeking efficient, adaptable, and long-lasting access and odour control solutions.

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If you would like to know more about how composite materials could support your next project, get in touch below.

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