

# Reuse of PFAS-Impacted Soil at a Remote Mine Site in Australia Using a Circular Economy Approach

## Background

At an iron ore mine in the Pilbara Region of Western Australia, PFAS contamination was discovered near a former truck wash bay during a facility upgrade. The soil leachate contained PFAS levels of 1,350 ng/L, including PFOS, PFOA, and other related compounds. Due to the site's remote location, options such as landfill disposal or thermal destruction were not viable. Instead, RemBind® was selected as a cost-effective and sustainable solution for immobilising the PFAS and enabling on-site reuse of the treated soil.



Figure 1: Sample Locations at a Former Truck Washdown Area at an Iron Ore Mine Site in the Pilbara Region of Western Australia

## Methodology

Soil samples were collected and subjected to treatability testing using RemBind® at varying dosage rates (1-5%). Following the treatment process, leachability tests were conducted to measure the reduction of PFAS in the soil. Full-scale treatment was performed with an excavator for soil mixing and a water truck for dust suppression.

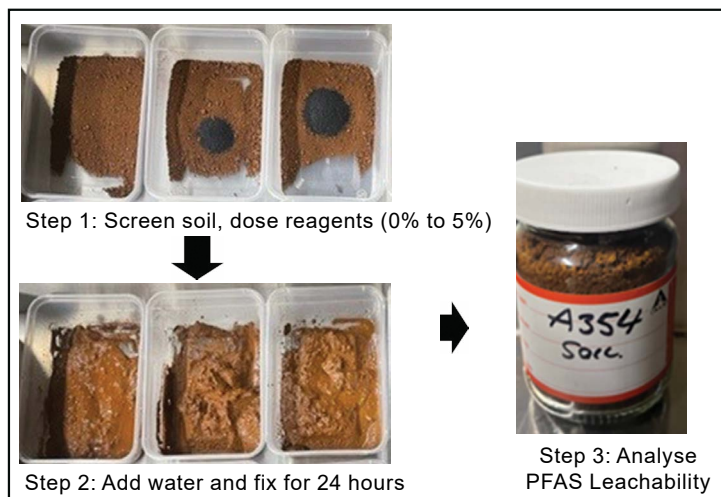


Figure 2: Bench-Scale Treatability Trial Methodology

## Results and Discussion

The treatability trial demonstrated that a 1% addition of RemBind® was sufficient to reduce PFAS leachability to below detectable levels. Full-scale treatment confirmed these results, achieving significant reductions in PFAS levels in the treated soil.

Sample ID	Soil ID	RemBind 100X Dosage (w/w)	RemBind 100 Dosage (w/w)	Sum PFAS (ug/L)	PFAS Leachability Reduction
R1	Position 1	0%	-	1.09	-
R2	Position 1	1%	-	<0.01	>99.0%
R3	Position 1	2%	-	<0.01	>99.0%
R4	Position 1	5%	-	<0.01	>99.0%
R5	Position 2	0%	-	0.89	-
R6	Position 2	1%	-	<0.01	>98.9%
R7	Position 2	2%	-	<0.01	>98.9%
R8	Position 2	5%	-	<0.01	>98.9%
R9	Position 3	0%	-	0.61	-
R10	Position 3	1%	-	<0.01	>98.4%
R11	Position 3	2%	-	<0.01	>98.4%
R12	Position 3	5%	-	<0.01	>98.4%
R4A	Position 1	-	5%	<0.01	>99.0%
R8A	Position 2	-	5%	<0.01	>98.9%
R12A	Position 3	-	5%	<0.01	>98.4%

Sample ID	Soil ID	RemBind 100 Dosage (w/w)	Sum PFAS (ug/L)	PFAS Leachability Reduction
RT0	Position 1	0%	1.35	-
RT1	Position 1	1%	<0.01	>99.3%
RT2	Position 1	2%	<0.01	>99.3%
RT5	Position 1	5%	<0.01	>99.3%

**1% addition of RemBind® 100 reagent reduced PFAS leachability to <LOR for all PFAS species**

Figure 3: Bench-Scale Treatability Trial Results

## Conclusion

This project highlights the effectiveness of using RemBind® for immobilising PFAS in soil, particularly at remote sites. The ability to reuse treated soil onsite aligns with sustainable practices and circular economy principles, while minimising the environmental impact compared to other treatment methods.



Figure 4: Mixing RemBind® into Soil with Excavator