

A wide-angle photograph of a golf course under a clear blue sky. In the foreground, a lush green fairway stretches towards the background. To the left, a dense line of tall, dark green trees casts long shadows across the grass. A golf cart is parked on a path near the trees, with two people standing nearby. One person is holding a golf club. A golf bag on a trolley is also visible. The overall scene is bright and sunny, with vibrant green grass and clear blue skies.

Marri Park Golf Course:
**IRRIGATION AND
AGRONOMY IMPACT REPORT**



NewGround



Executive **SUMMARY**

Over the past twelve months (July 2025 – June 2026), we conducted a comprehensive trial of President Water Vortex Generators across our irrigation systems at Marri Park Golf Course. Our objective was to evaluate the technology's true impact on our production bore water consumption, turf resilience, and overarching operational efficiency.

The results have been a sweeping success, made even more significant by our challenging Bassendean sand soil profile. We concluded the trial year with our lowest bore water consumption in memory — achieving a 30.1% reduction against our previous three-year average. By indexing our water usage against historical localised rainfall, we have isolated the vortex generators as the clear catalyst for these savings. Furthermore, enhanced water efficacy dramatically improved our soil moisture retention and turf health, allowing us to completely eliminate routine returfing for the first time in recent history.

Technology Trial: President Water Vortex Generators

Trial Period: July 2025 – June 2026

Location: 34 Marri Park Dr, Casuarina, Western Australia -
Coordinates: 32.2356749, 115.8614999

1. Water Usage and Historic Averages

Our course operates with a total production bore allocation of 432,000 m³ per financial year. Protecting this allocation while maintaining high-quality playing surfaces is our top priority.

To definitively measure the impact of the vortex generators, we compared our 2025-2026 trial year extraction against our individual previous years, as well as our aggregated 3-year historical baseline.

Financial Year	Bore Water Used (m ³)	% of Licence Allocation	Variance from 3-Year Avg
2022 - 2023	353,065	81.7%	-
2023 - 2024	354,407	82.0%	-
2024 - 2025	297,978	69.0%	-
Prior 3-Year Average	335,150	77.5%	Our Baseline
2025 - 2026 (Trial)	234,018	54.2%	30.1% Reduction

By the close of the 2025–2026 financial year, our total bore usage had dropped to just 54.2% of our licence allocation. This represents a 21.5% volumetric reduction strictly compared to last season, and a massive 30.1% reduction against our previous 3-year historical average.

Full bore metered numbers at the conclusion of the document.

2. Isolating Generator Efficiency: Litres per mm of Rain

We are aware that irrigation requirements fluctuate with the weather. To prove that these savings were generated by the vortex technology and not simply a byproduct of a wetter season, we calculated our efficiency ratio by indexing the daily rainfall at our exact coordinates against the volume of water we pumped:

Bore Litres used per millimetre of natural rainfall.

-	2022 - 2023: 471,570 Litres per mm of rain
-	2023 - 2024: 656,552 Litres per mm of rain (Dry year anomaly)
-	2024 - 2025: 381,485 Litres per mm of rain
-	2025 - 2026 (Trial): 298,150 Litres per mm of rain

Our Key Finding: The financial years of 2024-2025 and 2025-2026 provided us with virtually identical natural rainfall conditions (781.1 mm vs. 784.9 mm). Historically, our irrigation demands would have mirrored one another. Instead, with the vortex generators running in 2025-2026, **our reliance on supplemental irrigation dropped by 21.8% per millimetre of rain.**

This metric proves that our treated water provided vastly superior soil penetration and moisture retention, allowing our team to drastically reduce pumping volumes under the exact same climatic conditions.

The source for rainfall data was Open-Meteo Historical Weather API.

Open-Meteo aggregates decades of historical weather data using global and local meteorological reanalysis models, which combine localised weather station readings and satellite data to provide highly accurate weather measurements for specific GPS coordinates.



3. Turf Health, Bassendean Sand, and The Elimination of Returfing



Beyond absolute water volume savings, the qualitative change in our turf has been exceptional, especially given our local geology.

Marri Park Golf Course is built on a **Bassendean sand** soil profile. As any turf manager knows, this sand type is notoriously fast-draining, highly prone to becoming hydrophobic (water-repellent), and possesses extremely poor natural moisture retention. Historically, combatting this profile required us to execute aggressive watering regimes and regular returfing (turf laying) to repair dry patches and turf fatigue. It is a highly resource-intensive maintenance reality for our team.

However, during the 2025-2026 trial, **we did not have to perform any returfing.**

The vortex-treated water fundamentally altered how moisture interacted with the Bassendean sand. By reducing the surface tension of the water, the generators improved soil penetration and deep root hydration, effectively overcoming the natural hydrophobic tendencies of the sand profile. Our existing turf was able to withstand seasonal stress and recover naturally. Because establishing new turf typically requires intensive, high-volume watering, eliminating this maintenance step provided us with immense compounding water savings and serves as indisputable agronomic proof of the system's effectiveness.

Pictured Below 16th Fairway - Previously scarred with brown patches (donut circles) from poor sprinkler coverage.

4. Additional Operational Synergies

While this report focuses heavily on quantified volumetric data and rainfall indexing, it is critical to acknowledge the broader, cascading operational savings we generated over the past year.

Pumping over 100,000 m³ less water than our three-year historical baseline has yielded a massive reduction in our tertiary operational inputs. While we have not itemised the specific dollar figures in this document, the facility has realised significant and obvious cost savings in:

- **Power Consumption:** Dramatic reductions in our kilowatt-hour (kWh) electricity due to significantly lower pump run-times and extraction durations across Bores 1 through 4.
- **Hardware Longevity:** Substantially decreased wear and tear on our expensive bore pumps, irrigation lines, and valving, directly extending the lifespan of our vital infrastructure.
- **Labour and Maintenance:** Highly impactful reductions in labour hours across our grounds team, driven primarily by the total eradication of returfing tasks, alongside fewer manual interventions for spot watering.



5. Summary

The President Water Vortex Generators have transformed our irrigation profile at Marri Park Golf Course. By indexing our water usage against corresponding localised rainfall, the data confirms a pure irrigation efficiency gain of nearly 22%, completely independent of seasonal weather variations. When applied to our notoriously difficult Bassendean sand profile, the treated water bypassed our historic moisture-retention issues, resulting in the complete elimination of routine returfing.

This twelve-month trial proves that vortex-treated water not only protects our vital 432,000 m³ water allocation, but it fundamentally elevates the agronomic baseline of our turf while driving down power, hardware, and labour burdens across our entire operation.



6. Bore Meter Results

Continued on following pages.

Marri Park Golf Course Production Bores Usage:

Total Allocation 2022 -2023	432,000
Budget 2022-2023	432,000
Total Usage to date	353,065
Total Remaining	78,935
Percentage to Budget	111.7%
Percentage to 2022-2023 Licence Allocation	81.7%



6. Bore Meter Results

Continued on following page.

Marri Park Golf Course Production Bores Usage: MU = Monthly Usage

Month Date		Bore 1		Bore 2		Bore 3		Bore 4	
		Meter (m3)	MU	Meter (m3)	MU	Meter (m3)	MU	Meter (m3)	MU
	30th June 2022	953,883		278,943		621,725		592,259	
1	30th July 2022	953,883	0	278,943	0	621,725	0	592,259	0
2	30th August 2022	953,883	0	278,943	0	621,725	0	593,952	1,693
3	30th September 2022	954,927	1,044	0	0	621,725	0	594,526	574
4	31st October 2022	957,833	2,906	3,870	3,870	621,785	60	596,581	2,055
5	30th November 2022	970,246	12,413	25,838	21,968	647,005	25,220	610,809	14,228
6	31st December 2022	988,300	18,054	59,173	33,335	662,723	15,718	613,282	2,473
7	31st January 2023	1,005,901	17,601	88,186	29,013	677,204	14,481	617,787	4,505
8	28th February 2023	1,026,954	21,053	119,685	31,499	692,412	15,208	622,997	5,210
9	31st March 2023	1,029,488	2,534	140,173	20,488	702,281	9,869	632,067	9,070
10	30th April 2023	1,031,290	1,802	144,277	4,104	703,971	1,690	635,573	3,506
11	31st May 2023	1,031,484	194	146,607	2,330	705,179	1,208	637,294	1,721
12	30th June 2023	1,031,484	0	146,721	114	705,234	55	637,493	199
Totals		Totals	77,601	Totals	146,721	Totals	83,509	Totals	45,234
New Meter bore 2-September 2022									353,065

6. Bore Meter Results

Marri Park Golf Course Production Bores Usage:

Month	Date	Total Production Bore usage (m3)	Actual Accumulative Total	Projected Monthly Usage	Projected Accumulative	Under/ Over	Daily Projected Usage	Actual Average Daily Usage
	30th June 2022							
1	30th July 2022	0	0	1,550.0	1,550	-1,550	52	
2	30th August 2022	1,693	1,693	1,550.0	3,100	-1,407	50	
3	30th September 2022	1,618	3,311	9,276.0	12,376	-9,055	309	54
4	31st October 2022	8,891	12,202	33,415.0	45,791	-33,589	1,078	287
5	30th November 2022	73,829	86,031	43,839.0	89,620	-3,589	1,414	2461
6	31st December 2022	69,580	155,611	51,793.0	141,413	14,198	1,671	2245
7	31st January 2023	65,600	221,211	50,563.0	191,976	29,235	1,631	21116
8	28th February 2023	72,970	294,181	47,388.0	239,364	54,817	1,692	2606
9	31st March 2023	41,961	336,142	41,978.0	281,342		1,354	1354
10	30th April 2023	11,102	347,244	22,575.0	303,917		753	370
11	31st May 2023	5,453	352,697	10,500.0	314,417		350	
12	30th June 2023	368	353,065	1,550.0	315,967		50	
Totals		353,065		315,967			10,404	

New Meter bore 2-September 2022

6. Bore Meter Results

Continued on following pages.

Marri Park Golf Course Production Bores Usage:

Total Allocation	432,000
Total Usage to date	297,978
Total Remaining to Licence	134,022
Percentage to 2024-2025 Licence Allocation	69.0%
Total Budget Calculation to ET Projected	315,967
Total Usage 2024-2025	297,978
Total Usage Remaining ET Applications	17,989
Percentage to Licence Budget	94.3%



6. Bore Meter Results

Continued on following page.

Marri Park Golf Course Production Bores Usage: MU = Monthly Usage

Month	Date	Bore 1 (Driving Range)		Bore 2 (First Hole)		Bore 3 (Compound)		Bore 4 (Ninth Hole)	
		Meter (m3)	MU	Meter (m3)	MU	Meter (m3)	MU	Meter (m3)	MU
	30th June 2024	1,144,125	1	250,855	0	1,805	0	84,424	0
1	30th July 2024	1,144,144	19	250,855	0	1,805	0	85,519	1,095
2	30th August 2024	1,144,144	0	250,855	0	16,705	14,900	87,520	2,001
3	30th September 2024	1,144,144	0	250,855	0	31,121	14,416	91,084	3,564
4	31st October 2024	1,144,146	2	269,407	18,552	37,306	6,185	98,577	7,493
5	30th November 2024	1,155,335	11,189	290,959	21,552	11,046	2,788	103,386	4,809
6	31st December 2024	1,171,175	15,840	305,525	14,566	13,633	2,587	107,373	3,987
7	31st January 2025	1,189,025	17,850	327,073	21,548	17,175	3,542	111,938	4,565
8	28th February 2025	1,203,378	14,353	337,362	10,289	19,409	1,879	135,580	23,642
9	31st March 2025	1,214,354	10,976	10,145	10,145	3,471	3,471	141,933	6,353
10	30th April 2025	1,221,471	7,117	15,833	5,688	4,306	835	149,096	7,163
11	31st May 2025	1,222,226	755	16,519	686	4,306	0	149,898	802
12	30th June 2025	1,222,226	0	16,519	0	4,306	0	150,672	774
Totals		Totals	78,102	Totals	103,026	Totals	50,603	Totals	66,248
								297,979	

6. Bore Meter Results

Marri Park Golf Course Production Bores Usage:

Month	Date	Total Production Bore usage (m3)	Actual Accumulative Total	Projected Monthly Usage	Projected Accumulative	Under/ Over	Daily Projected Usage	Actual Average Daily Usage
	30th June 2024							
1	30th July 2024	1,114	1,114	1,550.0	1,550	-436	52	
2	30th August 2024	16,901	18,015	1,550.0	3,100	-14,915	50	
3	30th September 2024	17,980	35,995	9,276.0	12,376	23,619	309	599
4	31st October 2024	32,232	68,227	33,415.0	45,791	22,436	1,078	1040
5	30th November 2024	40,338	108,565	43,829.0	89,620	18,945	1,414	1345
6	31st December 2024	36,980	145,545	51,793.0	141,413	4,132	1,671	1193
7	31st January 2025	47,505	193,050	50,563.0	191,976	1,074	1,631	1532
8	28th February 2025	50,163	243,213	47,388.0	239,364	3,849	1,692	1792
9	31st March 2025	30,945	274,158	41,978.0	281,342	-7,184	1,354	998
10	30th April 2025	20,803	294,961	22,575.0	303,917	-8,956	753	693
11	31st May 2025	2,243	297,204	10,500.0	314,417	-17,213	350	
12	30th June 2025	774	297,978	1,550.0	315,967	-17,989	50	
Totals		297,978		315,967			10,404	

For further information contact:

SAM BUTLER - SUPERINTENDENT

marrisp@newground.net.au



NewGround