

Case Study: Pinnacle College

Waste to Oasis: Pinnacle College's Wastewater Revolution.

Overview

We transformed Pinnacle College's outdated septic tank into a modern, eco-friendly wastewater treatment plant.

The college now proudly utilises wastewater that's ideal for irrigation, transforming potential waste into a beneficial resource.

Requirements/On-site challenges

The school had an existing septic tank with a French drain, however, the system did not meet the relevant requirements of the National Water Act.

Our objective was to utilise their current system and upgrade it to not only ensure that the effluent was safe to release back into the environment without any negative impact, but also fit to re-use for irrigation purposes.

Solution

We enhanced their existing septic tank system by introducing a Bio-reactor. This reactor contains a tank filled with fixed film plastic media, providing a surface for biomass to attach. The tank is aerated, allowing aerobic bacteria from the wastewater to consume the organic compounds present.

In the treatment's final phase, the settled effluent undergoes disinfection to remove pathogenic bacteria, ensuring the water is safe for irrigation and minimizing disease outbreak risks. For this particular system, we use a combination of Ozone and Chlorine to purify the wastewater.

Client information

Pinnacle College is a private institution that embraces South Africa's rich multicultural tapestry, equipping students with a broader perspective of the nation and the world beyond.



Location

Rynfield, Benoni



Industry

School



Plant size

30kL per day



Project date

13/11/2020







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Results

The wastewater treatment plant's resulting final effluent meets all the effluent quality parameters for the General Standards of the National Water Act.

	WATERLAB (Pty) Ltd <small>Reg. No.: 1983/009165/07 V.A.T. No.: 4130107891</small>						
	23B De Havilland Crescent Perseur Techno Park Meiring Naudé Drive Pretoria	P.O. Box 283, Perseur Park, 0020 Tel: +2712 - 349 - 1066 Fax: +2786 - 654 - 2570 e-mail: admin@waterlab.co.za			T0391		
CERTIFICATE OF ANALYSES							
GENERAL WATER QUALITY PARAMETERS							
Date received: 2023-02-10 Project number: 1000		Report number: 117624		Date completed: 2023-02-23 Order number:			
Client name: Calcamite Address: P.O Box 911-561, Rosslyn, 0200 Telephone: 012 742 0900		Facsimile: 086 231 3340		Contact person: Ms. L. Becker e-mail: louise@calcamite.co.za Mobile: 063 173 9430			
Analyses in mg/l (Unless specified otherwise)	UOM %	Method ID	Wastewater Discharge Limits *		Sample Identification		
			General Limits*	Special Limits*	Pinnacle College Chlorine	Pinnacle College Ozone	
Sample Number					184653	184654	
Date/Time Sampled					N/A	N/A	
pH - Value @ 25 °C	A	7.7	WLAB065	5.5-9.5	5.5 -7.5	6.3	6.4
Electrical Conductivity in mS/m @ 25°C	A	7.0	WLAB065	**	***	103	101
Suspended Solids at 105°C	A	8.6	WLAB004	<25	<10	6.0	2.0
Nitrate as N	A	4.8	WLAB046	#	##	42	39
Ortho Phosphate as P	A	14	WLAB046	<10	****	6.8	6.8
Chemical Oxygen Demand as O ₂ (Total)	A	5.6	WLAB018	<75	<30	56	60
Oil & Grease	A	---	WLAB034	<2.5	0	1	1
Faecal Coliform Bacteria (MPN/100 ml)	A	5.3	WLAB021	<1000	0	12	54
Free and Saline Ammonia as N	A	10	WLAB046	<6	<2	4.4	2.1
<small>* = Revision of general authorizations in terms of section 39 of the national water act, 1998 (act. No. 36 of 1998). Special limits apply in certain specific catchment areas. ** = Not more than 70 mS/m increase above intake to a maximum of 150 mS/m *** = Not more than 50 mS/m increase above intake to a maximum of 100 mS/m **** = <1 mg/l (median); <2.5 mg/l (maximum) # = General limit for combined nitrate and nitrite of <15</small>							
							
J. Ngobeza - Chemical Technical Signatory			M. Ramaboea - Microbiological Technical Signatory				
<small>A = Accredited N = Not Accredited S = Subcontracted UoM=Uncertainty Of Measurement Tests marked "Not SANAS Accredited" in this report are not included in the SANAS Scope of Accreditation for this Laboratory. Results marked "Subcontracted Test" in this report are not included in the SANAS Scope of Accreditation for this Laboratory. Sample condition acceptable unless specified on the report. Microbiological standards dictate that zero cannot be reported in cases where no growth is observed. The requirement is to then report as <1cfu/g or ml. A result of <1 implies the absence of the specific test organism and is the lowest reportable result where no growth was detected. The information contained in this report is relevant only to the sample/samples supplied to WATERLAB (Pty) Ltd. This report, or any parts of this report, shall not be reproduced by any means, except with the written approval of the Board of WATERLAB (Pty) Ltd. Details of sample conducted by Waterlab (PTY) Ltd according to WLAB/Sampling Plan and Procedures/SOP are available on request.</small>							
Bacteriological parameters analysed on: 2023-02-10					Page 1 of 1		

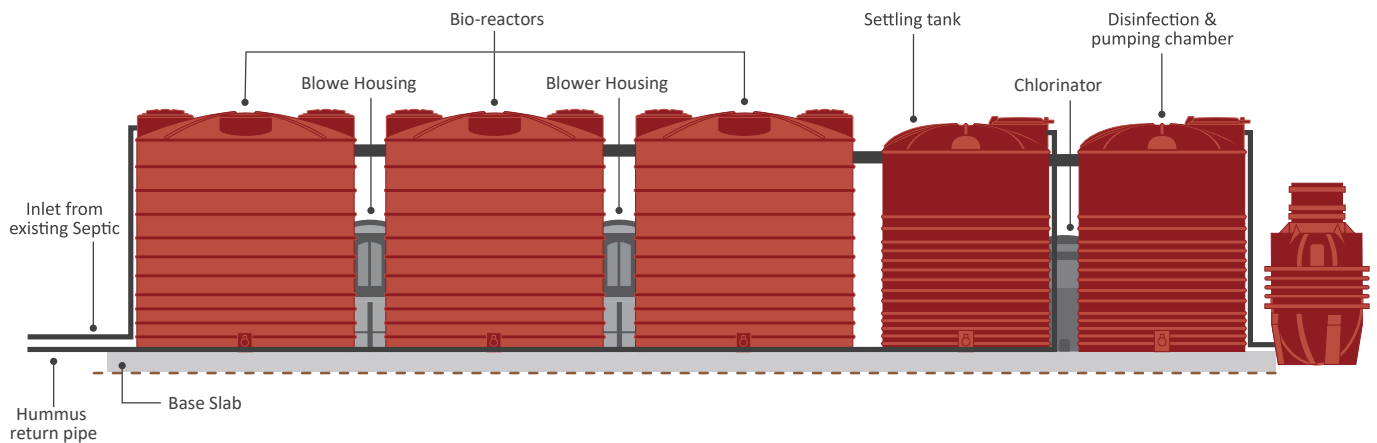
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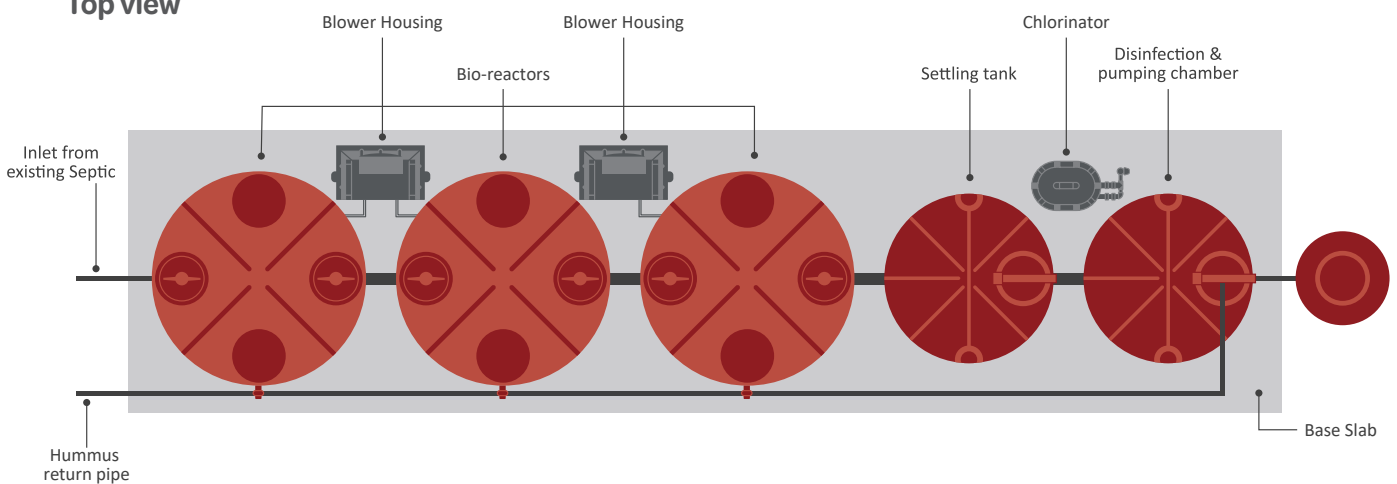
Plant specifications

Side view

ADWF: 30m³/day
Plant type: Above ground



Top view



Conclusion

Effective wastewater management in educational institutions not only ensures a clean and secure learning atmosphere but also cuts down on water usage, leading to decreased water expenses.