SCD Probiotics

Case Study Summary – Cartagena, South America

Wastewater - Controlling Odor and Reducing Bacterial Load

Industry:	City Government
Application:	SCD Probiotics Technology used to control odor and improve water quality in city sewage system
Customer:	Acuacar, public utility
Where:	Cartagena, Colombia, South America
When:	May - July, 2008
Products:	Secondary products made from SCD ProBio Balance™ Plus and SCD Bokashi Balls
SCD Licensee:	OASIS Ambiental EU

Customer Problem

The Cartagena tourist area faced foul odors coming from the public manholes of the urban sewage wastewater, causing a health concern especially in the rainy season when the manholes overflowed.

The project concentrated on three geographic areas served by one pumping station with a pumping volume of about 5400 m^3/day (6500 m^3/day during the busy tourist season).

The overall length of the sewage system was 21 km, and the total retention time was 2.5 hours (approximate time the probiotic products had to impact the water quality).

Goal

- To control odors in the sewage system and pumping stations in three targeted areas;
- To reduce the levels of TSS, COD, and BOD;
- To reduce Total Coliforms and Fecal Coliforms, improving outflow water quality

Table 1: Environmental Regulation Standards & Baseline Data

Parameter	Outflow Standard for Treated Water	Baseline Data May 8, 2009
Chemical Oxygen Demand (COD)	250-500 mg/L	703 mg/L
Biological Oxygen Demand (BOD)	110-220 mg/L	385 mg/L
Total Suspended Solid (TSS)	100- 200 mg/L	400 mg/L

Methodology

The SCD Probiotics used were a mixed culture of beneficial microorganisms without genetic manipulation. These microorganisms are present in natural ecosystems and physiologically compatible with each other; when they come in contact with organic matter, they accelerate the process of decomposition without allowing putrefaction.

SCD Probiotics in liquid form were applied directly to the manholes of each targeted sector following a strict plan and methodology. In addition, SCD Bokashi Balls (solid microbial concentrate) were dropped in the manholes according to a strict plan throughout the trial period.

Results

Samples were taken in the three pumping stations every week for 3 months. Lab results were systematically recorded and analyzed to adjust the application plan if necessary.

All samples were taken and analyzed by the personnel of Acuacar/EPA and counter-samples were analyzed by a private laboratory. The final results, agreed upon by both parties, are from a single pumping station (EBAR) at a single site (Bocagrande).

Significant results (Table II) were demonstrated and all goals of the project were achieved.

- Total Suspended Solids (TSS) was reduced by 68%
- Biological Oxygen Demand (BOD) was reduced by 66%
- Chemical Oxygen Demand (COD) was reduced by 25%
- Oils & Grease were reduced by 8%
- The presence of foul odors in the interior and exterior of the manholes showed remarkable reduction
- The bacterial load also showed significant reductions: Total Coliforms by 91% and Fecal Coliforms by approximately 76%

Tables III and IV provide additional data from the trial period. More information is available by contacting customerservice@SCDProbiotics.com.

Table II: Goals of project achieved

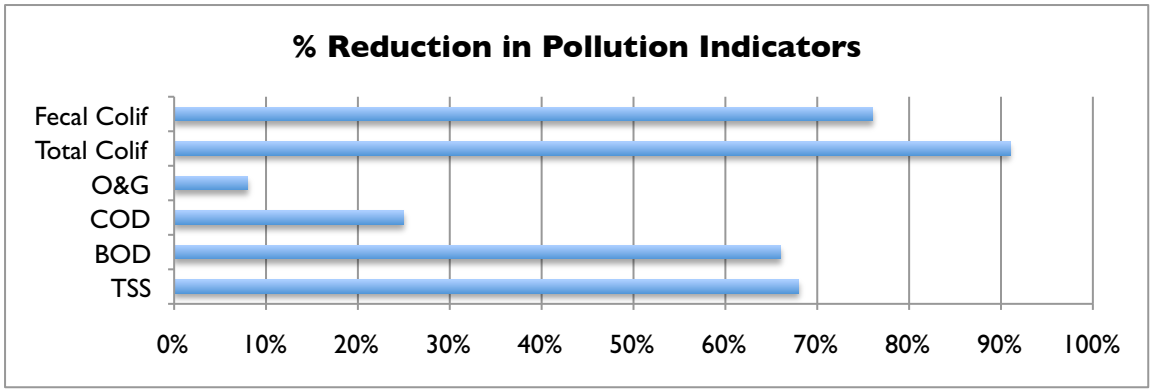

Table III: Sample Results at Bocagrande, including May 8 baseline data

	Data	Temp °C	pH	TSS mg/L	COD mg/L	BOD mg/L	O&G mg/L	T.C. NMP/100mL	F.C. NMP/100 mL
Acacar Standards				100-200	250-500	110-220			
Date									
8 May 08	Baseline	31.1	7.17	400	703	385	62	1.40E+08	5.50E+07
15 May 08	Muestra	31.7	7.20	276	622	377	48	2.00E+07	2.00E+07
23 May 08	Muestra	31.2	6.85	468	737	568	116	2.80E+07	2.80E+07
30 May 08	Muestra	30.4	7.25	195	473	386	79	2.00E+07	2.00E+07
6 June 08	Muestra	31.1	7.44	211	404	209	100	2.70E+07	2.70E+07
13 June 08	Muestra	31	7.35	202	476	206	84	X	X
23 June 08	Muestra	30.7	7.56	266	490	211	44	2.30E+07	2.30E+07
27 June 08	Muestra	31.4	7.26	196	574	138	93	5.40E+07	5.40E+07
4 July 08	Muestra	30.7	7.35	183	600	132	67	2.50E+07	2.50E+07
11 Jul 08	Muestra	30.1	7.48	197	453	211	58	3.20E+06	3.20E+06
17 July 08	Muestra	30.6	7.43	167	514	132	57	1.30E+07	1.30E+07
24 July 08	Muestra	31.3	7.31	129	529	130	136	X	X

Table IV: Odor Control Sample Data From All Three Test Sites

GAS ANALYSIS IN ACUACAR-CARTAGENA, COLOMBIA

Date of Result	DATA	Location	H_2S mg/L	CO mg/L	LEL mg/L	O_2 mg/L	REMARKS
	Standards		< 10	< 10	< 10		Biosystem Scent meter
5/8/2008	BASELINE	Bocagrande	20-30				
5/30/2008	SAMPLING						LEL= Letal and
		1. Outside chamber	0	2	0	20.9	explosive gases
		2. Inside chamber	0	5	2	20.9	
		3. Sample	5	6	3	20.9	
5/8/2008	BASELINE	Castillogrande	60				
5/30/2008	SAMPLING						
		1. Outside chamber	0	0	2	21.1	
		2. Inside chamber	3	4	2	20.9	
5/8/2008	BASELINE	Laguito	10				
5/30/2008	SAMPLING						
		1. Outside chamber	0	0	3	21.3	
		2. Inside chamber	0	0	6	20.9	

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