

## Abstract:

*In May of 2005, the City of Meridian, Texas DCALA, Ltd., conducted a 30-Day trial to assess the ability of [EM•1® Waste Treatment](#) to control odor, grease, and phosphorus levels within the city's wastewater collection and treatment system. Activated EM•1® was applied through an injection pump. The application rate was calculated based on the loading and volume of influent. Odor was eliminated within 2 hours of the first application and did not return until after the trial had completed. Grease solids that were visible on lift station walls were digested within the first week of applications. Phosphorus levels from dropped from 3.92 to 0.13 during the 4-week trial.*

## Purpose:

Grease and odor were the primary concerns of the City. As the local area has quite a bit of dairies and processing plants, phosphorus reduction is another major concern. The objective was to see if EM•1® could reduce odors and phosphorus without dramatically increasing costs for treatment to the city.

## Method:

The total flow and loading rates were supplied by the City of Meridian. EM•1® was activated according to the directions on our website. Applications were done on a daily basis at one lift station. The feed rate was a ratio of 1 part Activated [EM•1® Waste Treatment](#) per 10,000 gallons of wastewater per day.

## Analysis:

Not all data was available from the city records. Perhaps the numbers were not collected.

BOD is almost identical as the previous year's analysis. Influent data is available only for two weeks of each month. The two numbers from the third week of April and first week of May are 203 and 192 respectively. All influent measurements of BOD for the rest of May and June are lower than 170. Perhaps will a longer trial going on for several more months an effect on BOD could have been determined.

A significant drop in Total phosphorus was achieved. Levels of Total phosphorus did jump back immediately after ceasing application of [EM•1® Waste Treatment](#), demonstrating the EM•1® applications had an impact on total phosphorus levels.

Residual effects remained on DO for about two weeks after [EM•1® Waste Treatment](#) applications perhaps a sign of residence time of microbes.

Review of the 2004 data on TSS show a trend that the TSS is not stable. During the month of [EM•1® Waste Treatment](#) applications, the TSS dropped during the first week and remained low and stable during the rest of the month. Perhaps continued applications would have maintained this. EM•1® Waste Treatment has been studied in several fields for its applications on controlling EC. EC is directly related to TSS and charged particles tend to stay in suspension. By dropping the EC, suspended solids drop out and TSS drops. Most data on EM•1® Waste Treatment applications will demonstrate about a 50% drop in TSS on average, cutting polymer usage by about 50% in the sludge handling side of treatment. This drop in EC also is demonstrated in the ability of [EM•1® Waste Treatment](#) to remove calcium buildup in piping and on equipment.

<b>Week One</b>	<b>Effluent April 2004</b>	<b>Effluent May 2004</b>	<b>Effluent June 2004</b>	<b>Effluent April 2005</b>	<b>Effluent May 2005</b>	<b>Effluent June 2005</b>
<b>BOD</b>	2	4	5	5	4	6
<b>TSS</b>	5	8	11	10	7	5
<b>pH</b>	7.38	7.06	7.25	7.5	7.53	7.43
<b>DO</b>	7	6.8	6.2	7.8	8.4	8.4
<b>Total Phosphorus</b>	2.74	1.27	3.19	1.44	3.92	4.15

<b>Week Two</b>	<b>Effluent April 2004</b>	<b>Effluent May 2004</b>	<b>Effluent June 2004</b>	<b>Effluent April 2005</b>	<b>Effluent May 2005</b>	<b>Effluent June 2005</b>
<b>BOD</b>	5	5	4	10	4	5
<b>TSS</b>	14	8	4	11	7	11
<b>pH</b>	7.55	7.63	7.85	7.37	7.48	7.54
<b>DO</b>	8.4	5.4	5	7	5.6	9.4
<b>Total Phosphorus</b>	2.35	2.27	2.04	1.74	3.53	5.8

<b>Week Three</b>	<b>Effluent April 2004</b>	<b>Effluent May 2004</b>	<b>Effluent June 2004</b>	<b>Effluent April 2005</b>	<b>Effluent May 2005</b>	<b>Effluent June 2005</b>
<b>BOD</b>	2	3	3	10	4	3
<b>TSS</b>	4	5	6	34	4	4
<b>pH</b>	7.46	7.73	7.83	7.41	7.5	7.49
<b>DO</b>	6.6	6	5.8	6.2	7.8	8.2
<b>Total Phosphorus</b>	2.97	2.03	2.04	3.68	0.91	no data

<b>Week Four</b>	<b>Effluent April 2004</b>	<b>Effluent May 2004</b>	<b>Effluent June 2004</b>	<b>Effluent April 2005</b>	<b>Effluent May 2005</b>	<b>Effluent June 2005</b>
<b>BOD</b>	3	6	2	24	5	4
<b>TSS</b>	13	13	6	78	4	5
<b>pH</b>	7.25	7.93	7.5	7.42	7.58	7.57
<b>DO</b>	7.2	4.8	4.8	7.8	7	9.2
<b>Total Phosphorus</b>	1.32	3.09	3.07	6.4	0.63	no data

<b>Week Five</b>	<b>Effluent April 2004</b>	<b>Effluent May 2004</b>	<b>Effluent June 2004</b>	<b>Effluent April 2005</b>	<b>Effluent May 2005</b>	<b>Effluent June 2005</b>
<b>BOD</b>			3		4	

<b>TSS</b>			15		3	
<b>pH</b>			7.86		7.7	
<b>DO</b>			5.6		7.6	
<b>Total Phosphorus</b>			3.75		0.13	

**Conclusion:**

This project demonstrated the ability of EM•1<sup>®</sup> to deodorize the collection and treatment system, digest (not emulsify) grease, and reduce total phosphorus through the injection on one product. The most significant cost savings in applications of EM•1<sup>®</sup> is that capital outlay for new equipment is nominal. If the municipality wishes to purchase the injection systems, they can be purchased for as little as \$200 per unit.

The application of EM•1<sup>®</sup> into lift stations prevents corrosion from sulfuric acid, therefore cleaning the units and increasing the life of the equipment. This was visible at the injection point, which was black at the beginning of the trial and looked like new concrete by the end of the 3-week trial. Protection of equipment could save a municipality several hundred thousand dollars. Prevention of hydrogen sulfide in the collection system can also prevent crowning.

Sludge reduction was noticed during this treatment. Normally the City wastes sludge every 10 days. Sludge was not wasted once during the testing phase. We do know from previous tests with EM•1<sup>®</sup> that sludge reduction as high as 50% can be expected with regular applications.

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