

# Earth Remediation Group

*LRS (Landfill Remediation Solutions)*



*Clean, Sustainable, Renewable, Solutions for the Earth*



## **Executive Summary**

ERG has over 45 years of combined experience in Environmental cleanup from its extensive expertise within CRA World, who in their time was a leading Remediation company of major disaster sites like Love Canal and many others.

We are experts in remediation, construction and creative solutions to resolve current contamination issues, with solutions geared towards preventing future problems from occurring and impacting the environment.

We are teamed with world leading scientist and engineers to ensure every solution is safe to the earth, people, animals and plants living in and around these sites. We are committed to green solutions and leaving this planet a better place for our children and children's children.





## **ERG LRS (Landfill Remediation Services)**

Landfills have been impacting our natural resources for the past 70 years with no end in site till now. ERG has created a Landfill Remediation Solution that reclaims the land, remediates the harmful contamination in the soils and waters all while forever changing the source of the problem.

Using our advanced Remediation solutions we can remediate the Water and Soil contamination created by the Landfills. In addition, Building state of the art Waste to Energy Sites near the Landfill will resolve the source of the pollution by recycling and burning the waste creating new streams of revenue along with renewable energy.

**Imagine only Clean air, Clean Energy and Recaptured Resources!!!**



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# Landfill Ecological Impacts

Landfills have significant impact on Human lives, Animal lives, water and soil.

Using Seneca Meadows in Seneca Falls NY as an example. This Landfill was made from garbage mainly from New York City and surrounding areas. It is the highest point in Seneca County NY. Not something to be proud of. In fact it is something shameful.

The impact of this site, has affected lives around the landfill as far out of 5 miles due to water contamination, wildlife impact and soil contamination. In addition high cancer rates are linked to this landfill. Deer and other wildlife having injuries from Milk jug rings cutting off circulation in their legs, along with six pack plastic rings around necks of racoons and other animals. Water run off seeping into creeks and streams impact other areas around this landfill.

## Areas of impact:

- Human lives (Lives Lost) & associated financial loss
- Natural Resources negatively impacted
- Air Pollution
- Abandon homes and property
- Water pollution down into the Aquifer.
- Unusable land into the thousands of acre
- Nationally millions of affected acres





# Landfill to Green Waste to Energy Plants

With world resources finite, and increasing public awareness of the harmful effects of our ‘throwaway culture’, a move towards what’s known as a circular economy seems a sensible option. In short, this means making products last longer, and recovering materials or other benefits from them when they can’t be fixed.

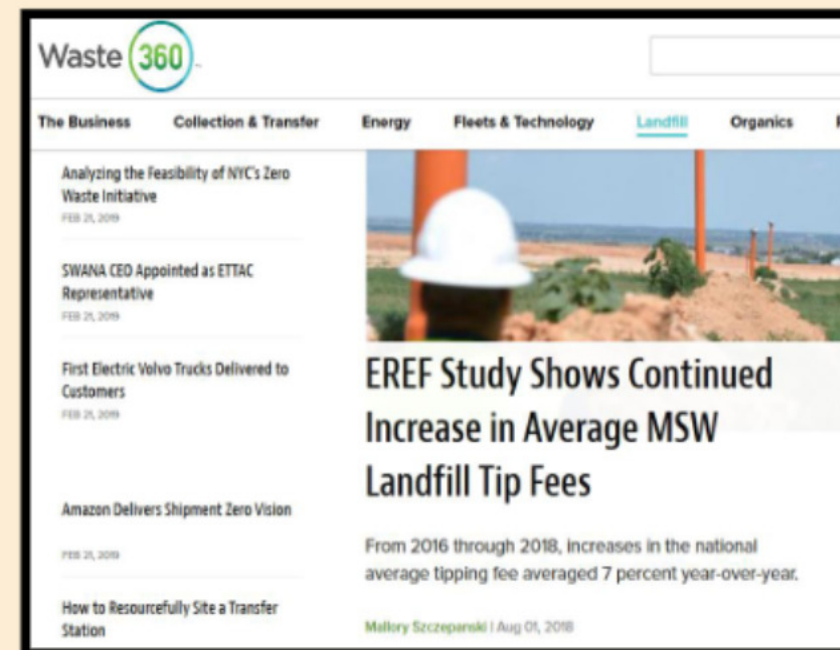
It places energy generation (recovery) below reducing waste, re-use, and recycling and composting, meaning it’s those options that should be considered first when managing waste; but above waste disposal meaning that waste-to-energy is preferable to landfill.



## Zero Landfill Mandates



## Rising Landfill Tip Fees



## Markets/Landfill Closures



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# LRS Program Overview

We at ERG believe in solving complex problems like this from a holistic approach by resolving the source of the issue, be it social engineering, political, natural, architecture or engineering issues. When we think of Architecture people think buildings, technology, etc... Our Architects have experience in these areas, in addition to Architecture on a grand scale from how it impacts all levels of Humans(including social), Nature and protecting natural resources. Something lost these past 100 years in our world.

## **For Landfills it's truly a simple problem to resolve. Stop the madness!!!**

Technology is here today to resolve the problems created over the past 100 years. ERG can resolve all the contamination issues in the soil and water. Together with our partners and government we can eliminate the problem through creating an Architecture solution that will remediate, protect of preserve our world going forward.

### **The benefits are tremendous and everlasting.**

- We save the planet #1 which we all need to continue to live here. There is no second Earth!!!
- We reclaim thousands of acres of land, remediated soil via ERG SEBS, repurpose for community shelf gardens!!!
- We reclaim tens of millions of gallons of fresh clean water via ERG SEBS, precious water resources for our future!!!
- We power millions of homes with this clean energy solution.
- Create new and recaptured revenue from the WEP sites,
- We Eliminate the Garbage problems of today, providing a cleaner brighter future of tomorrow.
- We provide new revenues in reclaimed materials and energy from WEP sites.
- We have when done eliminated, Ground, Air and Water Pollution.



# LRS Program Steps

The first step is one to recognize you have a serious problem, from decades of collecting waste in one or multiple locations in your area. Let's then establish a call with key stakeholders and arrange a site visit to a WGP Waste to Energy Plant "WEP" near you.

- After visiting the WEP Site, let's discuss the parallel efforts to clean up current contaminations sites.
- Work with ERG Architects to establish the Remediation Plan, a future WEP site and permanent solution for your area.
- Create Short term and long term remediation plans to engage current problems and stop spreading of any underground issues.
- Identify through analysis of deep water wells sites the depth and scope of the issue impacting your site.
- Implement our DERS (Deep Earth Remediation Subs) solutions immediately
- Start work on the Future WEP site below. This is the future and correct solution to resolving the issue forever.
- This same WEP site would be used to mine and emptied current landfills to the landfill is gone.
- Once emptied, ERG finishes the remediation effort.
- Your Landfill will now scale down to steady state using only the Waste to Energy solution from WGP



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# LRS - Day After

The day after you have completed the LRS program you have ushered in a new era in waste to energy management. You have eliminated all Water and Soil contamination. You now are creating renewable GREEN energy. Waste to Energy Plants in the US reduce, reclaim and recycle millions of tons of waste and millions of gallons of water per year.

Every year WEP Reduced and Reclaimed:

- Reduced 21 Million Metric Tons of Waste from Landfills
- Reclaim 1.1 million tons of materials and plastics for reuse.
- Reclaim 550,000 metric tons of metal

Every year WEP Recycled:

- 100 Million Gallons of Wastewater

Every Year WEP Powered:

- 1,000,000 + homes 27x7x365 @ Estimated 11,000,000,000 kWh per year \$990,000,000.00 @.09 cents per KW



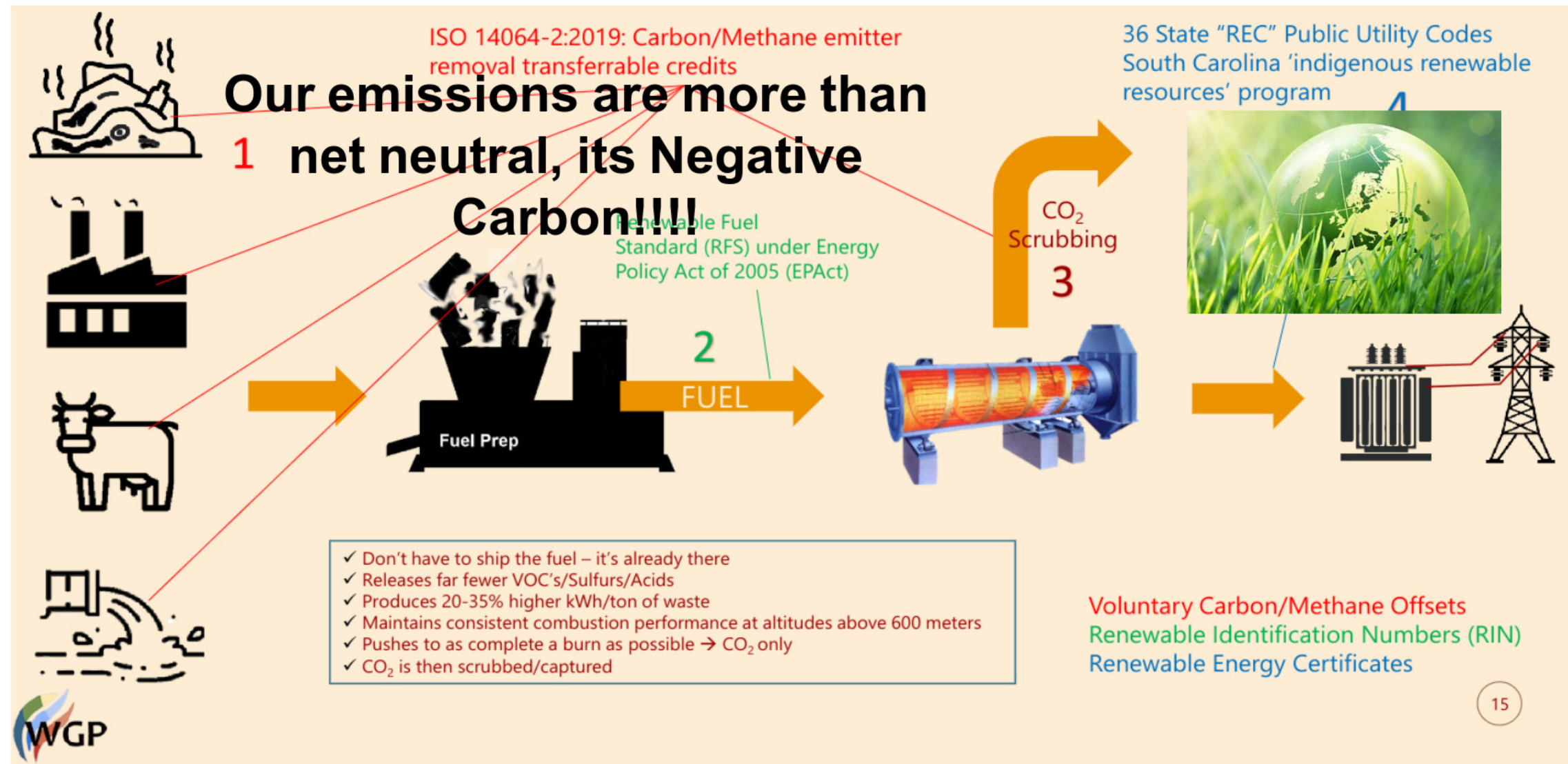
<b>21 Million</b>	<b>1.1 Million</b>	<b>550,000</b>	<b>100 Million</b>
Tons of waste diverted from landfill annually	Tons of material reused or recycled annually	Tons of metal recovered from waste	Gallons of wastewater recycled annually

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# Why WGP, because its the only true **Green WEP** Solution

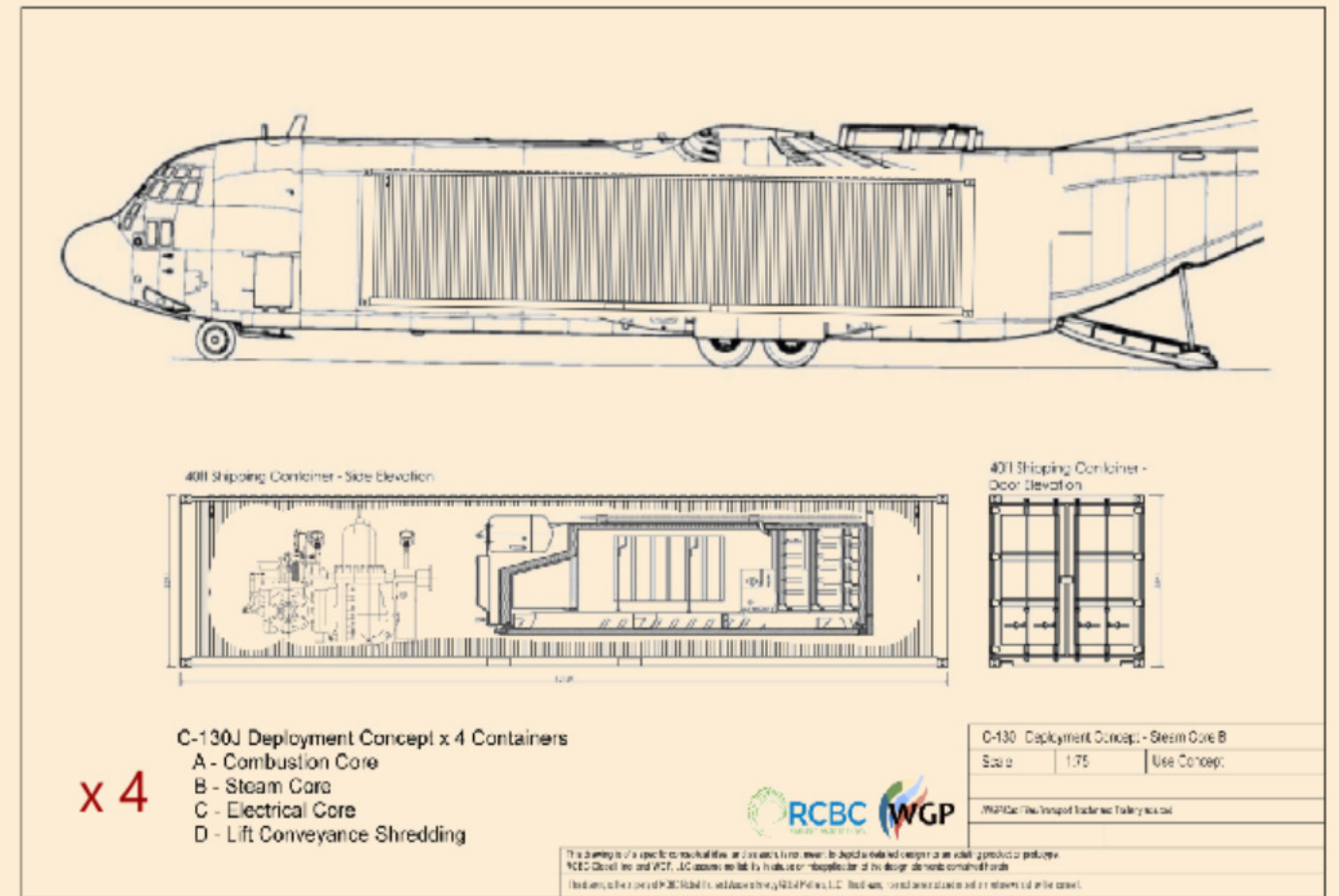
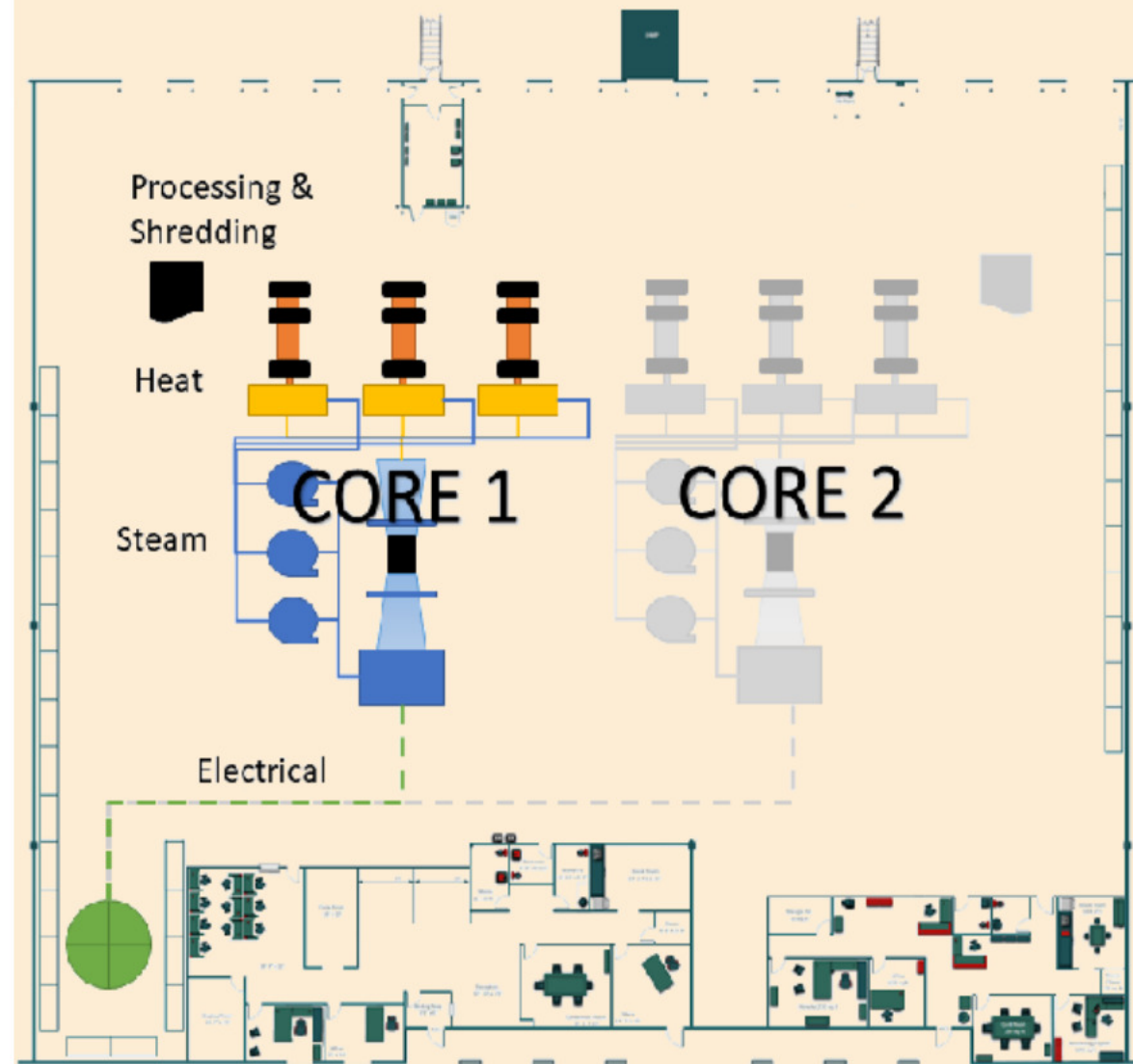
Simply put WGP is the most efficient, scalable modularized Waste to Energy solution available today. It can be assembled on-site, scaled up to meet the Remediation effort and in time be scaled down to meet normal run rates or steady state going forward. This saves you valuable time, land and resources. The benefits of WGP are exceptional and consumes all waste, wet or dry. In return creates pure clean energy to the Grid, and recovers valuable resources for reuse and repurposing or products.





# WGP unmatched scalability

## Modular and Scalable





## Summary & Next Steps

The ERG LRS Program is a holistic approach to a 100 year old problem that is truly running rampant in the world destroying valuable natural resources and effecting human lives. We can not only stop the issues, we can reverse the damages done over the last century to the water and earth itself.

**Together lets make Landfills a thing of the past and usher in  
a new era of Green Clean Waste to Energy Plants**

If your serious about helping resolve this crisis and leave the world a better and greener place. Contact Michael Berg at 516-428-2555



# Appendix



*Clean, Sustainable, Renewable, Solutions for the Earth*



# Pre / Post Treatment Results

FL Blue Green Algae o Lake Okeechobee. Any other FL BGA treatment / results

Other US / Canada BGA treatment / results:

Kansas Residential Lagoon (2020: 26 days post treatment)

Missouri Lake – Lagoon (2018: 3 month post treatment) Miller, Missouri Lake - Domestic Waste Lagoon (7 days post treatment)

St. Antoine, Nova Scotia Dairy Lagoon Bio-Augmentation (8, 19 days post)

US Red Tide o MOTE Marine Lab SEBS Efficacy Report- Dec 2019 Toxic dead fish decomposition

Other US lake / pond treatments & results

Kansas Hog Farm Lagoon & Sludge

Kansas Poultry Processing Plant Grease Pond





# Kansas Lagoon – SEBS Treatment



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# Missouri Lake – Municipal Wastewater & Lagoon





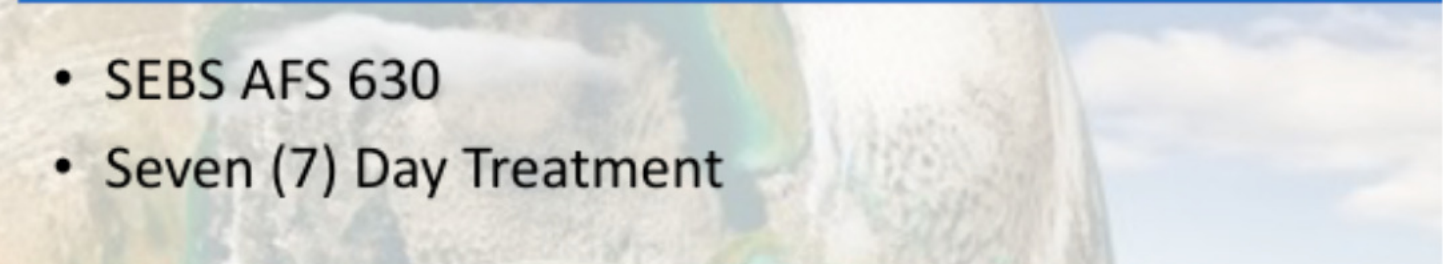
# Missouri Lake Domestic Waste Lagoon – SEBS Treatment

Pre-Condition



7 days post SEBS treatment

- SEBS AFS 630
- Seven (7) Day Treatment





# Nova Scotia – Dairy Lagoon Bio-Augmentation

## Pre-Condition

- Basin contained 5 million gallons of contaminated water



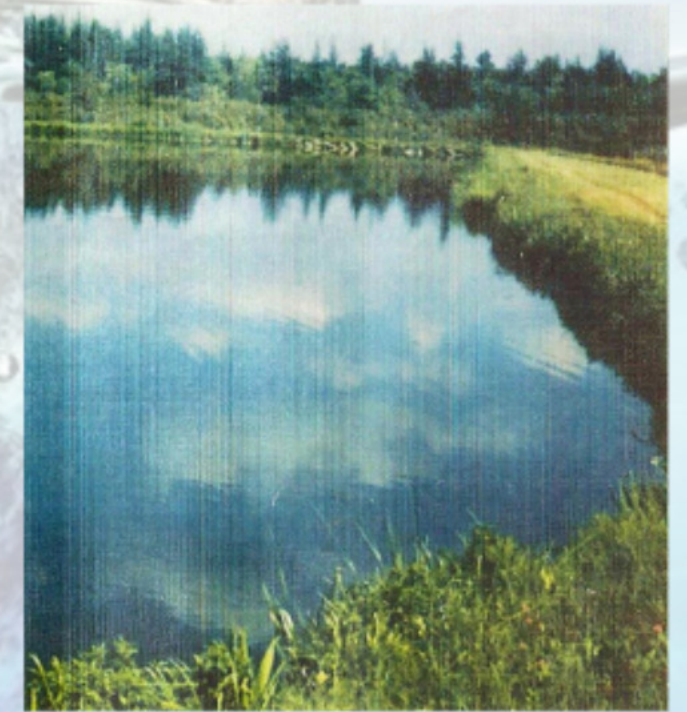
## 8 days post SEBS application

- Eliminated 90% of odor
- Eliminated 50%-60% of surface solids



## 19 days post SEBS application

- Eliminated 100% of odor
- Eliminated 95% of surface solids





# Red Tide EST SEBS Environmental Remediation

FL MOTE SEBS Efficacy Report - Dec 2019

Tested efficacy of SEBS Complex to both destroy *Karenia brevis* cells and eliminate toxins  
 Control, low (4  $\mu$ L) & high dose (12  $\mu$ L) tested in duplicate with cultures of the Manasota *Karenia brevis* clone. Cellular concentrations determined by microscopy at 0, 2, 24, and 48 hours



**Table 3: Percent Reduction in *K. brevis* cell concentration**

Time	4 $\mu$ L/L	12 $\mu$ L/L
2	30.23256	-10.0221
24	16.83434	43.3937
48	13.8191	-45.0586

\*MOTE Report included in attachments

**Figure 1: Cell Concentrations vs. Time**

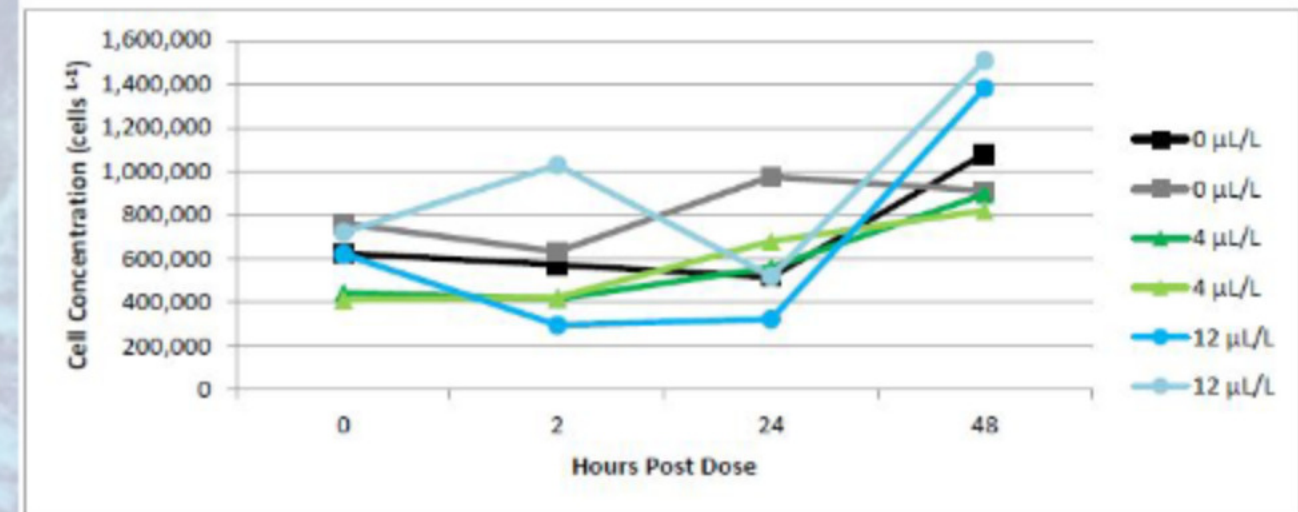


Fig.1: *K. brevis* cell concentrations were obtained and enumerated at T=0, T=2, T=24, and T=48 hours post dose. Doses include high (12  $\mu$ L/L), low (4  $\mu$ L/L), and control (0  $\mu$ L/L).



# SEBS Red Tide Fish Decomposition

	Initial	Day 3	Day 6	Day 8
Full Body				
Heads Only				<p>Heads Only continued to decompose – no photo available</p>



# Kansas Hog Farm Lagoon & Sludge

## Lagoon Pre-Condition

- 15 years old
- Top crust – 8" to 12"
- Dry crust – 4" to 8"



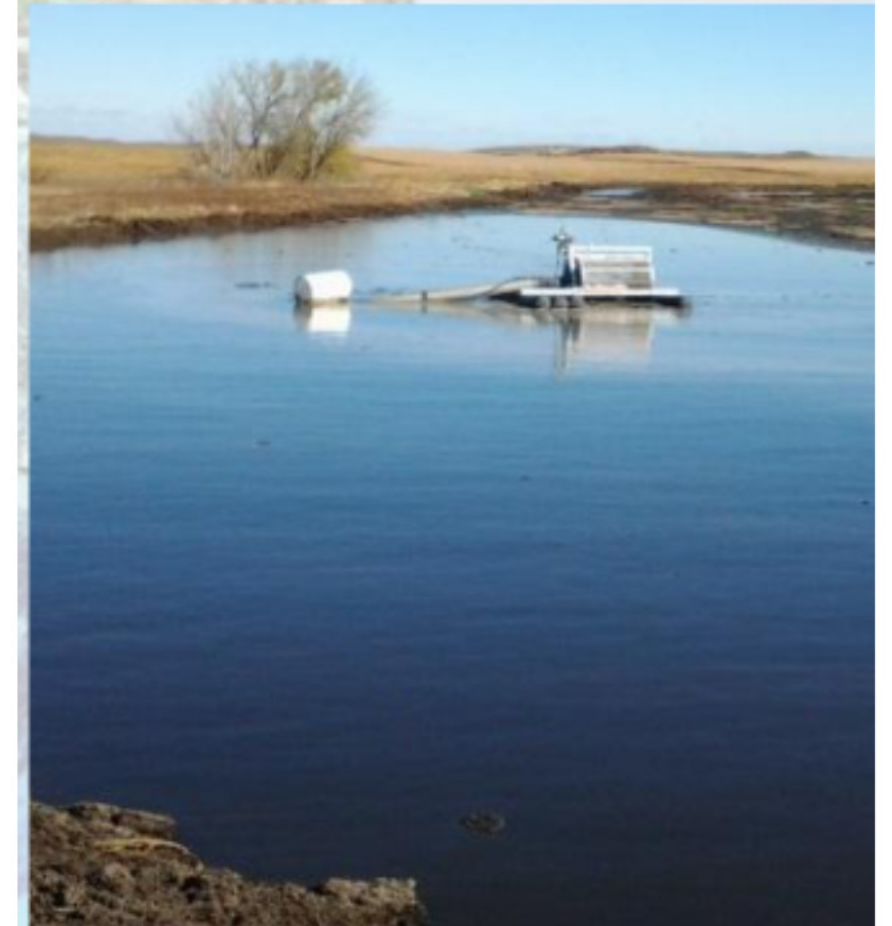
## 15 days post SEBS application

- Areas of liquid present in cracks that were completely dry previously
- Crust varied from 1" to 6" dependent on SEBS application



## 30 days post initial SEBS application; 2<sup>nd</sup> treatment

- Post 20 min. agitation
- Crust in agitator 1" and 3", was very loose & agitated quickly





# Kansas Poultry Processing Plant Grease Pond

Grease Pond Pre-Condition	Setup to introduce SEBS	After introducing SEBS	After 8.5 weeks
<ul style="list-style-type: none"><li>• Poultry fats</li><li>• Hard crust on edges, soft crust in middle</li><li>• Malodor</li></ul>	<ul style="list-style-type: none"><li>• Pipe installed</li><li>• SEBS pumped into pond with aeration</li><li>• Lagoon filled with water</li></ul>	<ul style="list-style-type: none"><li>• Bottom solids and crust begin breaking apart</li><li>• SEBS started digesting bottom &amp; suspended solids</li></ul>	<ul style="list-style-type: none"><li>• Eliminated floating grease</li><li>• Eliminated 80% of solids</li><li>• SEBS application of 5 gal/wk for continued maintenance</li></ul>
