Indoor Destruction of VOC's (Volatile Organic Compounds) via CAZ Biological System Air Purifiers

Scope: All Indoor Facilities that have VOC's from fugitive or direct sources.

Most indoor spaces today have VOC's off-gassing from paint, carpets, cabinets or direct emissions from furnaces, cars, chemicals etc.

Introduction:

Indoor air quality has degraded to the point that it is making us unhealthy. It is imperative that we mitigate the problem to insure the health of our families and pets. We breath more than 15,000 times a day. Unhealthy air is a root cause of many health issues and can lead to long term chronic health problems. VOC's or airborne gases are particularly problematic when we realize the we are breathing in these chemicals all day long every day.

CAZ Biological Systems for Remediating VOC's

There are many air cleaner systems on the market today, they all have pluses and minuses, none are nearly as effective as our Bio-Technology that captures and destroys without creating waste products.

We take a novel approach that is fundamentally different compared to the common mechanical, UV and filter-based systems available in the marketplace. CAZ utilizes the emerging science of bio-mimic that leverages the earth's natural systems for neutralizing pollutants. CAZ utilizes natural microorganism colonies that already reside all around us, the good bacteria of the microbiological world.

Our colonies of microorganisms and enzymes in H_20 capture the VOC's then, via biological respiration consume them for energy and completely neutralize them. This approach to man-made and or naturally occurring VOC's is revolutionary when being used by humans to control pollution. The Earth has been doing it and perfecting it for billions of years.

EPA Information on Indoor Air pollution and its effect on human health.

To access the full report:
https://www.epa.gov/report-environment/indoor-air-quality

Pollutants and Sources

Typical pollutants of concern include:

- Combustion byproducts such as carbon monoxide, particulate matter, and environmental tobacco smoke.
- Substances of natural origin such as radon, pet dander, and mold.
- Biological agents such as molds.
- Pesticides, lead, and asbestos.
- Ozone (from some air cleaners).
- **Various volatile organic compounds from a variety of products and materials.**

Most pollutants affecting indoor air quality come from sources inside buildings, although some originate outdoors.

Effects on Human Health

Health effects associated with indoor air pollutants include:

- Irritation of the eyes, nose, and throat.
- Headaches, dizziness, and fatigue.
- Respiratory diseases, heart disease, and cancer.

The link between some common indoor air pollutants (e.g., radon, particle pollution, carbon monoxide, *Legionella* bacterium) and health effects is very well established.

- Carbon monoxide is toxic, and short-term exposure to elevated carbon monoxide levels in indoor settings can be lethal.6
- Episodes of Legionnaires' disease, a form of pneumonia caused by exposure to the *Legionella* bacterium, have been associated with buildings with poorly maintained air conditioning or heating systems.7, 8
- Numerous indoor air pollutants—dust mites, mold, pet dander, environmental tobacco smoke, cockroach allergens, particulate matter, and others—are “asthma triggers,” meaning that some asthmatics might experience asthma attacks following exposure.9

While adverse health effects have been attributed to some specific pollutants, the scientific understanding of some indoor air quality issues continues to evolve.

One example is “sick building syndrome,” which occurs when building occupants experience similar symptoms after entering a particular building, with symptoms diminishing or disappearing after they leave the building. These symptoms are increasingly being attributed to a variety of building indoor air attributes.

Morrisview Healthcare - Morris Plains NJ
VOC's (Odorous Gases)

Sample Time Sequential Data Sets from Morrisview Healthcare Nursing Home Showing VOC's reduced to "zero".

After several weeks of running our system VOC's have been reduced to "zero" and have remained there for more than a year.

VOC Concentration Sample Real Time Data at Morrisview HealthCare Summary
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Unit Name ToxiRAE Pro PID(PGM-1800)
Unit SN G020001832
Unit Firmware Ver V1.80A
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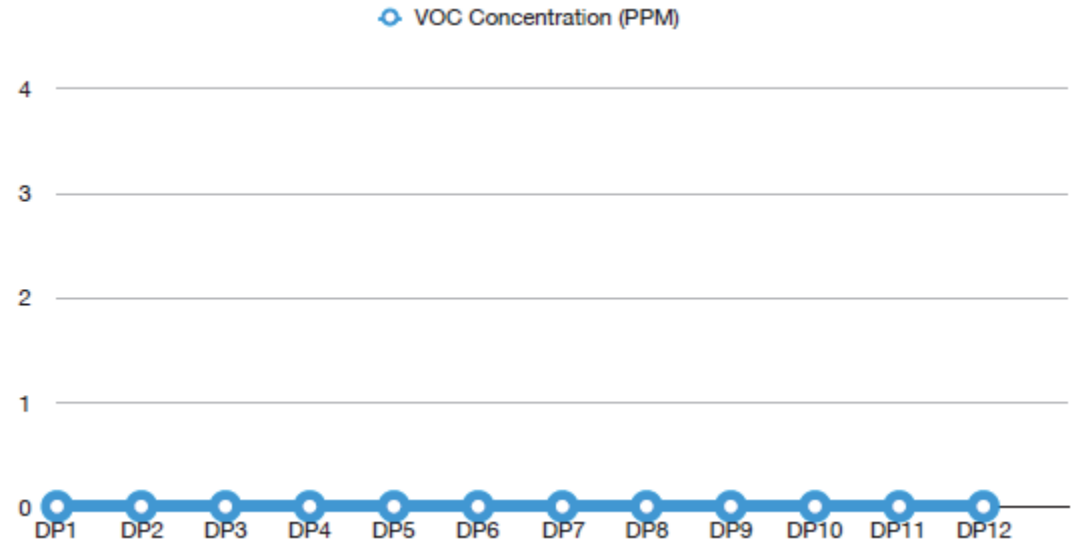
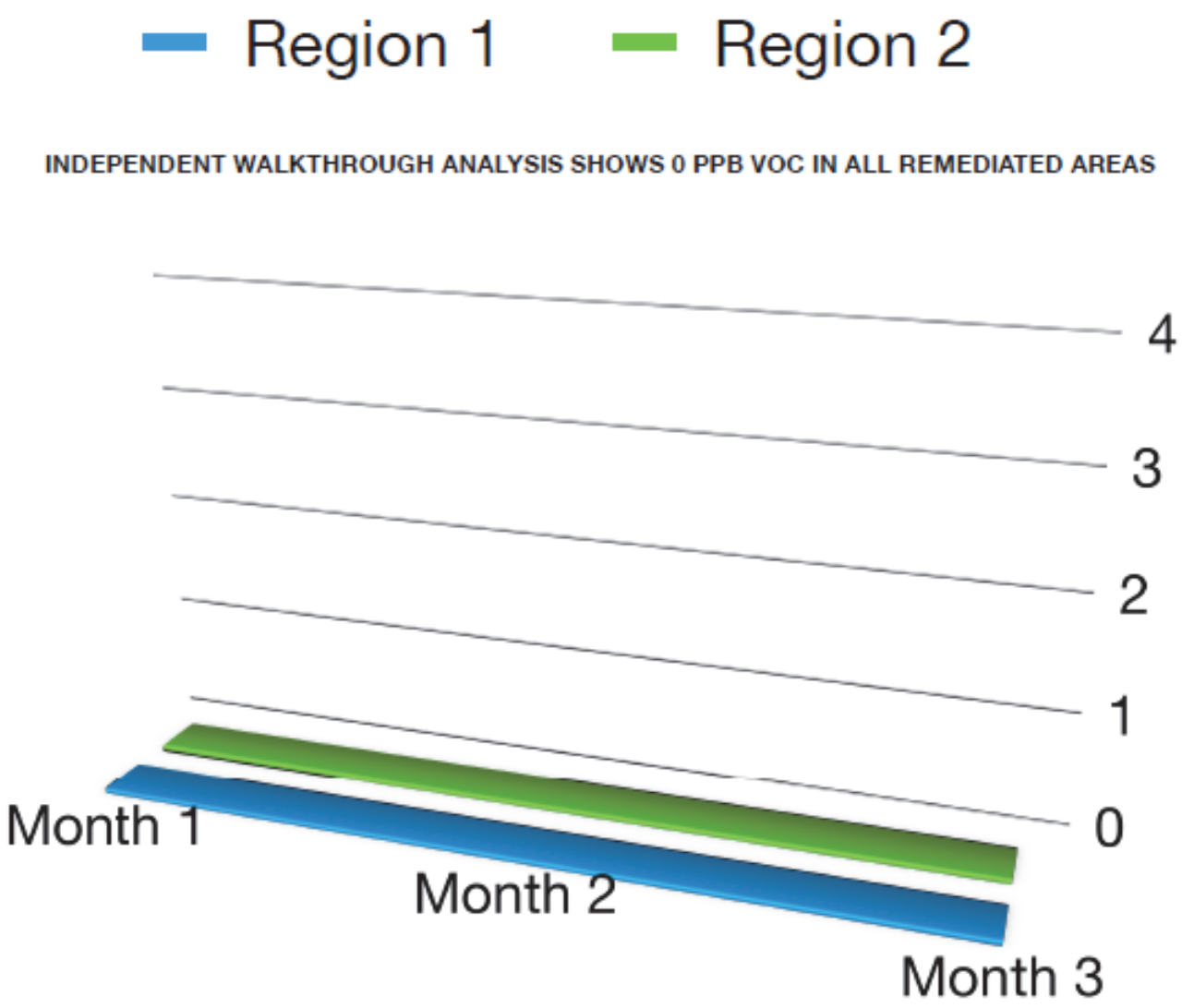
TWA/STEL

VOC(ppm) VOC(ppm)

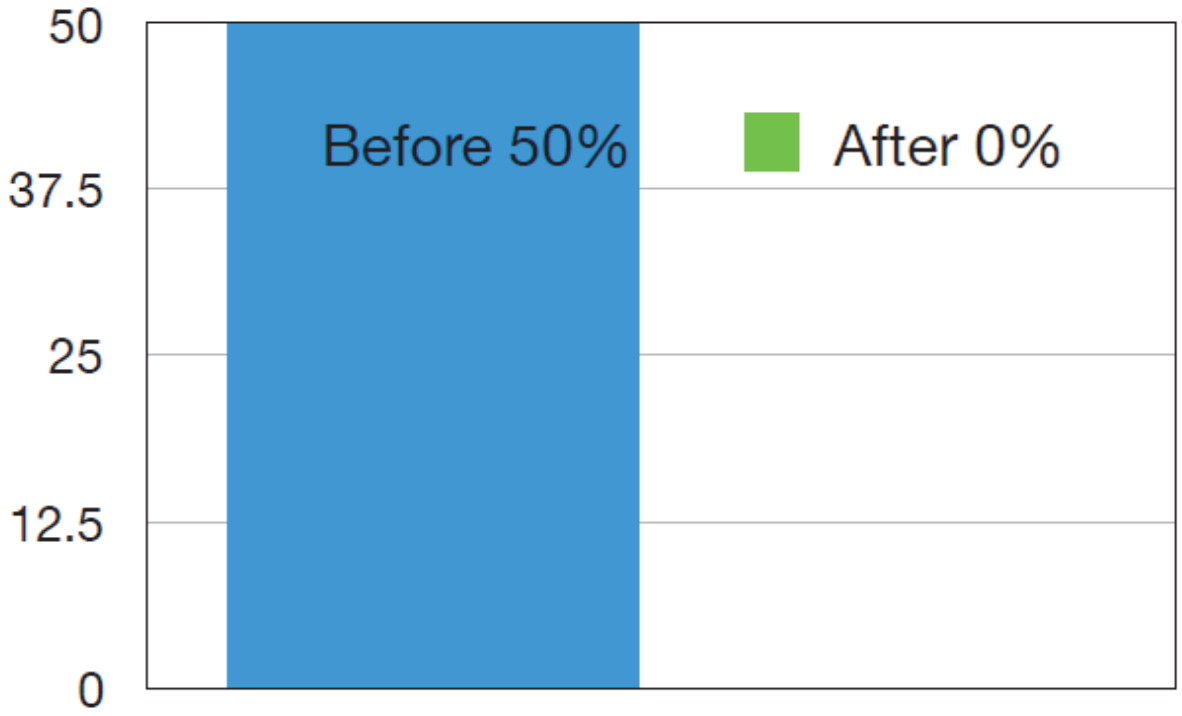
Index	Date/Time	(TWA)	(STEL)
001	7/10/2018	10:30:20	0.000 ---
002	7/10/2018	10:31:20	0.000 ---
003	7/10/2018	10:32:20	0.000 ---
004	7/10/2018	10:33:20	0.000 ---
005	7/10/2018	10:34:20	0.000 ---
006	7/10/2018	10:35:20	0.000 ---
007	7/10/2018	10:36:20	0.000 ---
008	7/10/2018	10:37:20	0.000 ---
009	7/10/2018	10:38:20	0.000 ---
010	7/10/2018	10:39:20	0.000 ---
011	7/10/2018	10:40:20	0.000 ---
012	7/10/2018	10:41:20	0.000 —



Morrisview Healthcare
Zone Analysis via ToxiRAE Pro 3 PID



Percentage of Time (Average) VOC's Above 300ppb World Health Organization Threshold Before and After CAZ Installation



Conclusion:

The CAZ system is highly effective at controlling, capturing and completely neutralizing VOC's (Volatile Organic Compounds).

In Residential, Commercial, Public and Light Industrial environments CAZ's Biotechnology can when properly deployed reduce VOC's to "zero".

Leveraging the Earth's natural air purification system is the most viable and cost-effective way to manage indoor airborne VOC's.