Dilution vs. Source Capture dehumidification

Description

Dilution vs. Source Capture

Comparing energy costs, performance, and indoor air quality.

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Energy Cost

Source Capture results in up to

0

cost savings over a 15 year lifespan.

Which could represent as high as

$
0

savings per year.

This is more than

0
x

the cost of new equipment.

Indoor Air Quality

Source capture is

0
x

**as eï¬?ective as dilution at
removing chloramines.**

**Source capture has been measured to reduce
chloramines to below World Health Organization defined maximum â??safe rangeâ?•.**

The difference between Dilution and Source Capture

1. Indoor Air Quality Comparison

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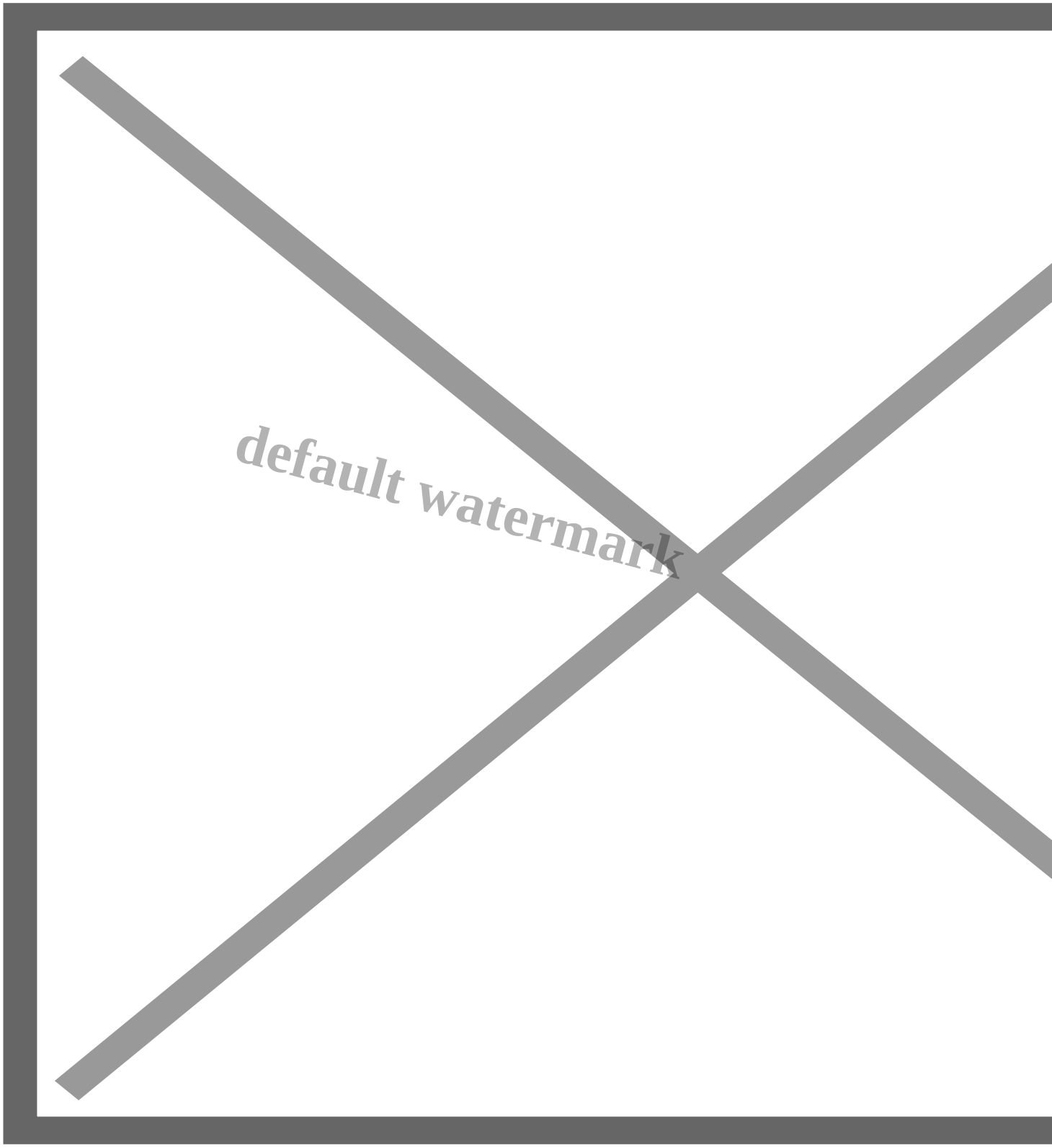
No Air Movement

Chloramines are 4 times denser than air, leading them to settle on the pool surface or â??breathing zoneâ?•, like a layer of scum, in the absence of any air disturbance.



Dilution/100% Outside Air

The Dilution approach to indoor air quality requires bringing in large volumes of outside air, targeting the pool surface. This causes the chloramine layer to be disturbed and absorbed into the rest of the room, leading to poor indoor air quality (IAQ). The chloramines are then partially exhausted.

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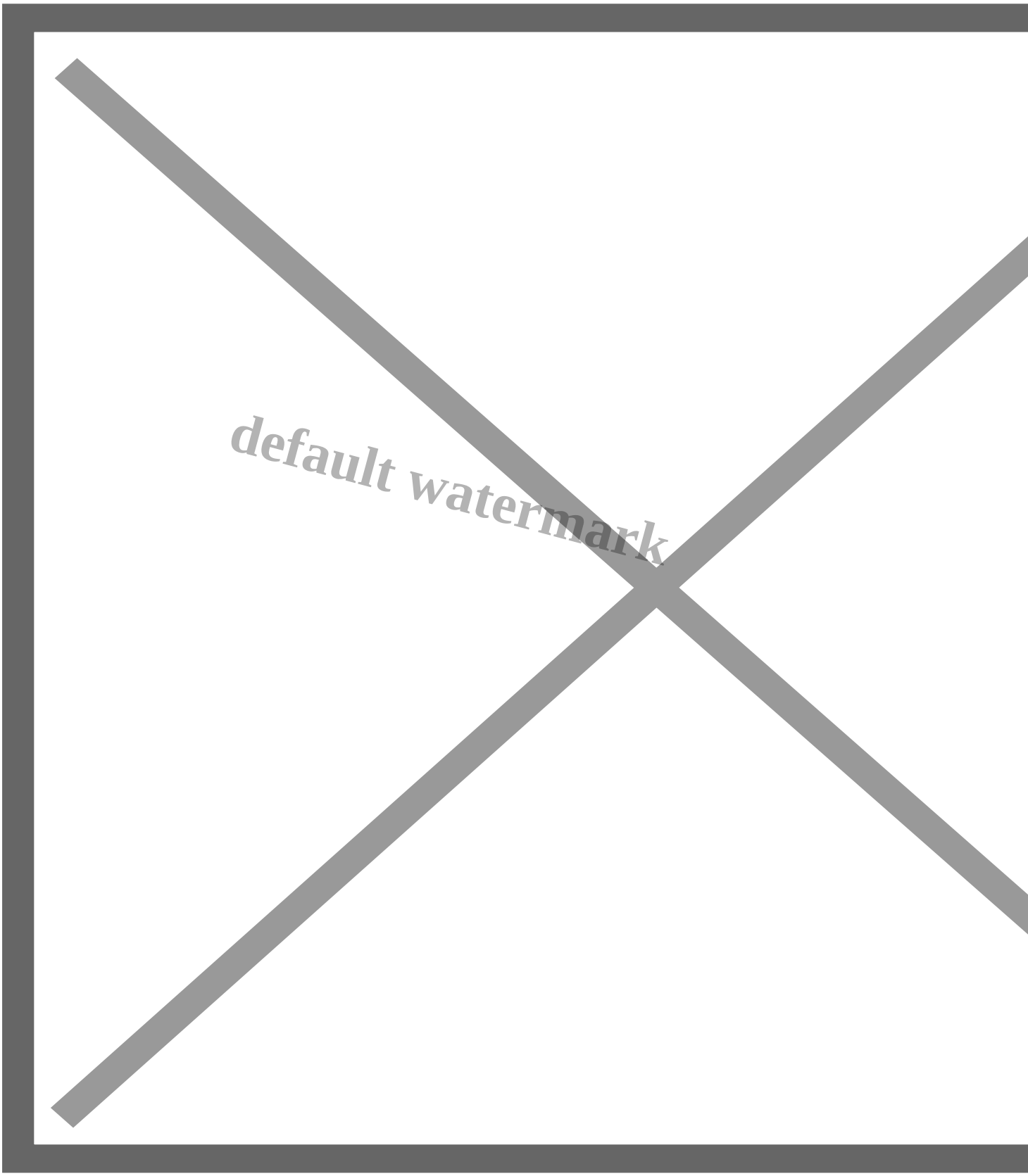
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Source Capture

Source Capture introduces a gentle air current at the pool surface level, which exhausts the chloramine-laden air â??at the sourceâ?•, without distributing the chloramines throughout the pool room. Dehumidifiers manufactured by Seresco can be specified with the Source Capture ready option.

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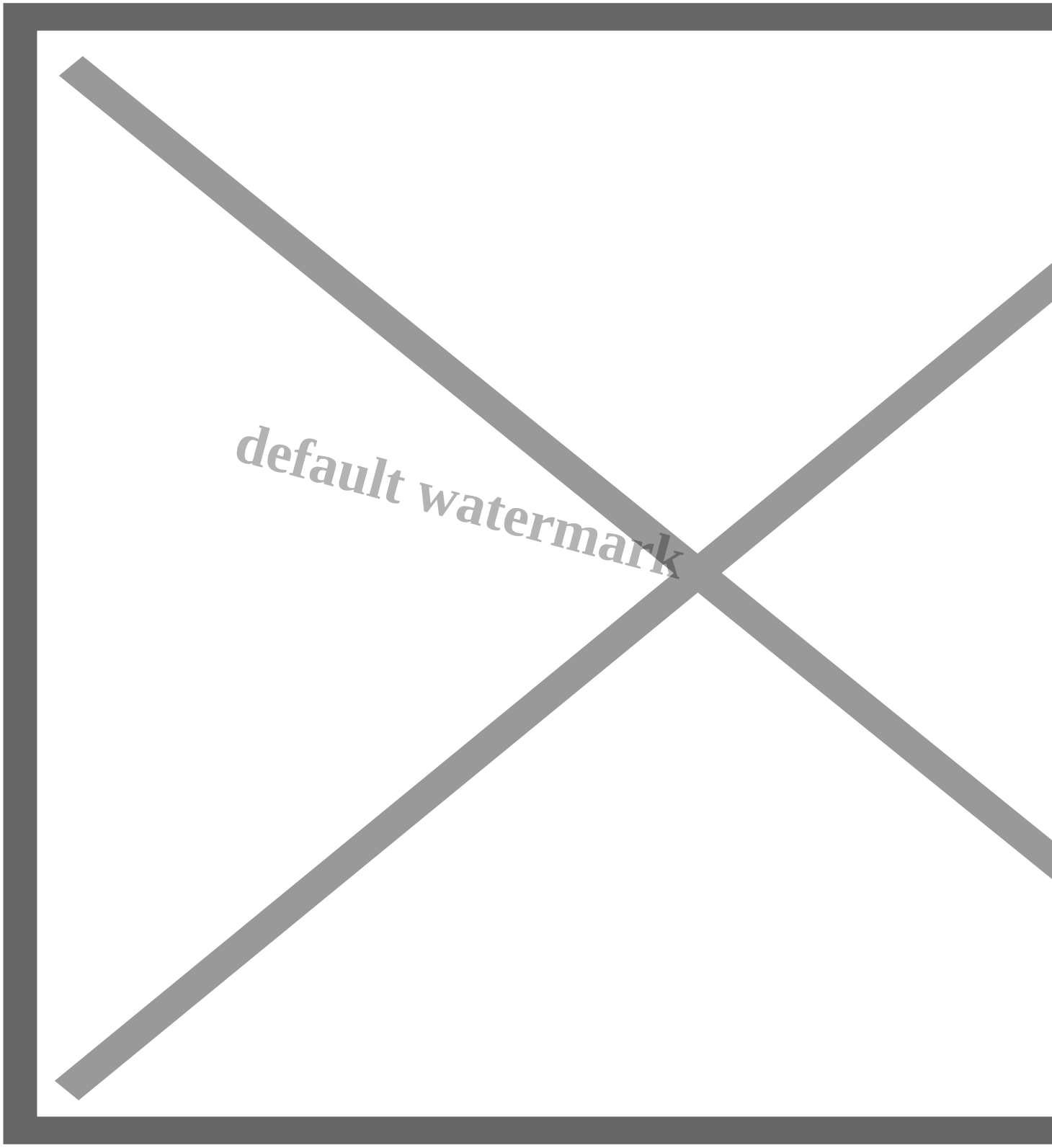

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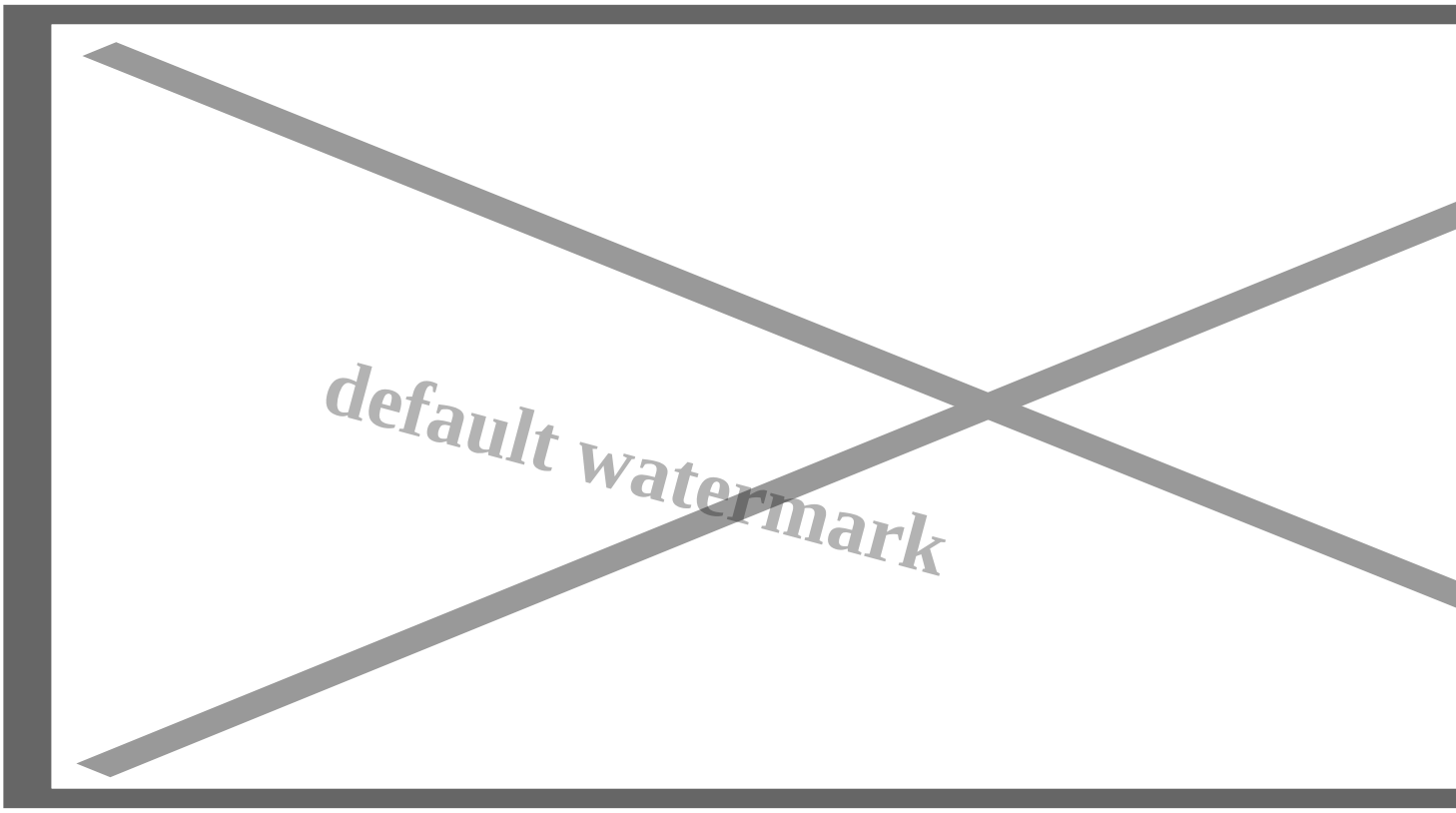
2. Effect of Source Capture on Nitrogen Trichloride (NCL3) at a YMCA by Purdue Universityâ??

Using Source Capture rapidly brings trichloramine levels well below the safe range as determined by the World Health Organization (WHO)



*Paddock Pool Equipment Company, Inc. Study of Source Capture of Airborne Chloramines. Paddock Pool Equipment Company, Inc., 2010. PDF.

3. Cost Savings Analysis

There is a significant operating cost penalty in using the Dilution approach due to the large amounts of outdoor air beyond what codes require being introduced. Source capture allows you to operate at code minimums while delivering lower chemical levels. When the equipment operates at minimums and optimizes the use of outdoor air and compressor operation, there are significant energy savings. Calculations are based on ASHRAE climate data.

0.4% DB/MCWB

	Dilution (constant outside air)	Dilution (constant outside air and compressor)	Source capture (compressor and optimized ventilation)	Compressor HP	Anuual savings	% reduction using source capture

Denver	$ 66,952	$ 70,034	$ 43,481	20	$ 26,553	40%
Minneapolis	$ 66,213	$ 68,830	$ 47,801	46	$ 21,029	32%
Washington DC	$ 62,558	$ 65,640	$ 45,836	46	$ 19,804	32%
Chicago	$ 64,493	$ 66,945	$ 46,611	46	$ 20,334	32%
Atlanta	$ 59,464	$ 66,845	$ 45,353	38	$ 21,492	36%
Dallas	$ 57,979	$ 65,360	$ 45,308	38	$ 20,052	35%
Boston	$ 60,363	$ 61,476	$ 42,236	30	$ 19,240	32%
Los Angeles	$ 58,405	$ 58,617	$ 37,904	20	$ 20,713	35%
Average	$ 62,053.38	$ 65,468.38	$ 44,316.25	Average reduction using source capture	$ 21,152.13	34%

calculations are based on ASHRAE climate data.

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Common Myths of the Dilution Approach

The following myths used to sell 100% outside air (OA) can cost you money, while yielding disappointing IAQ and overall comfort.

Using Outside Air alone provides energy savings over using compressors for humidity control

Calculations weâ??ve seen which show Outside Air to be more energy efficient incorrectly assume that compressors are operating at 100% 24/7, 365 days a year. Operating costs are 34% lower on average with Source Capture compared to Dilution (Refer to the table above)

Geography strongly affects how feasible and energy efficient Outside Air is, but there are savings to the compressor and optimized ventilation approach even in mild climates like Los Angeles (Refer to the table above)

A vast majority (>90%) of successful installations use a combination of both to ensure year-round comfort and energy savings

Dilution by bringing in more Outside Air than the code requires results in good Indoor Air Quality

Dilutionâ??s impact on Indoor Air Quality depends on air distribution. Even when 100% Outdoor Air is supplied, if it is not properly distributed from the supply duct to the breathing zone, certain areas will continue to experience Air Quality issues

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Source Capture chemical removal is not dependent on the supply air distribution to be effective, and has proven to bring chloramine levels below the World Health Organization â??safe rangeâ?• (Refer to the chart above)

The Benefits of the Source Capture Approach

The dilution air approach was mostly abandoned in the 80s when people discovered the compressorized approach to controlling their space delivered more reliable results and saved energy. Source capture delivers superior indoor air quality without the need for bringing in more outside air than the code requires.

Reduced Maintenance Costs

When you dramatically reduce the corrosive chemical levels you save money on associated maintenance issues.

Improved IAQ

With an integrated source capture solution, effectively removes chemicals from the source.

Peak Performance

Your athletes will perform at their absolute best when swimming in a better environment.

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Reduced Operating Costs

Reduce energy costs by 1/3 compared to constant OA systems.

Reduced Carbon Footprint

This system has the smallest energy footprint, reducing your carbon footprint to the absolute minimum.

Green Dehumidification Design

This system has the lowest refrigerant charge in the industry.

Plan your next project with help from our applications engineers

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