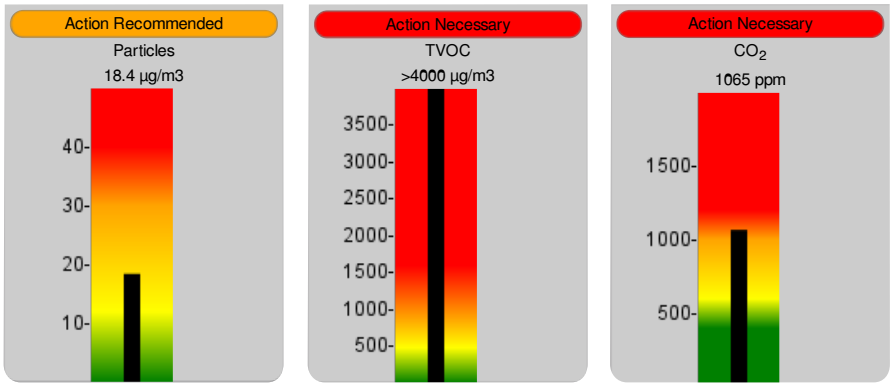
# MEASURED PERFORMANCE IN ACTION:
# OPTIMIZING IAQ SYSTEM RUN TIME

## An AirAdvice Case Study

## INITIAL 30-MIN. TEST

According to the HVAC Comfort Advisor, the 30-minute report showed the home had high particles, elevated chemicals, and CO2. The source of the chemicals was not found. We decided to run a multi day report to determine if the levels were chronic or just from an isolated event.



## BUILDING FEATURES

**Location:**
Houston, Texas

**Year & Style:**
1969 Ranch

**Number of Bedrooms:**
Four

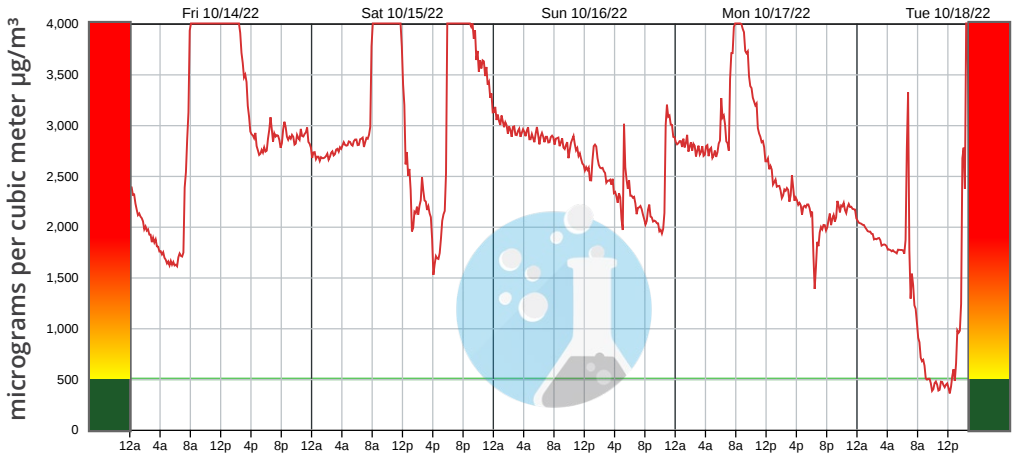
**Square Footage:**
2100 sq ft

**HVAC:**
Forced air Gas

## THE SmartIAQ REPORT

Multi-day testing revealed that the levels for particles, chemicals and CO2 were chronically elevated well beyond health-based recommendations. The equipment solutions were:

- **MERV 13 Whole home filter upgrade**
- **Fresh air intake to reduce VOCs and CO2 levels**
- **System runtime adjustment**




*Highest Daily Average:* **3717 µg/m³** *Highest Hourly Average:* **>4000 µg/m³** *Overall Average:* **2841 µg/m³**

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## SUMMARY

The initial results of installing the filter and fresh air vent did not show good results. So the contractors returned and increased the fan and ventilation run times, and the results improved dramatically.

- **Original report from Oct 6: Particles at 18, Chemicals off the charts >4000**
- **"Before" report from after we installed equipment but before we increased the fan run time and ventilation on Oct 18: Particles at 14, Chemicals at 2800**
- **"After" report from after we increased fan run time and ventilation on Oct 18 until now: Particles at 4, Chemicals at <700.**

> Your air quality has improved tremendously, and I'm attaching the reports to prove it. **Please take a moment to review, and then we can chat to confirm you are satisfied and answer any remaining questions.** I'm happy with the improvements, and I hope you will really feel those results at home and have much improved health as well! *– From the contractor to homeowner*

*(See results on next page)*

Simple solutions work! In this case filtration and ventilation. Attention to system runtime was critical in reducing the levels of pollution in this home.

| AirAdvice Test | Pre | Acceptable Level | Post | % Change |
|---|---|---|---|---|
| Particluates (µg/m³) | 13.5 | 10 | 4.2 | - 69% |
| VOC (µg/m³) | 2841 | 500 | 681 | - 76% |
| $CO_2$ (ppm) | 861 | 800 | 651 | - 24% |

From the contractor to AirAdvice:

*"Thanks for helping me talk through this situation with you the other day. We went back and increased the fan and ventilation run times, and the results have improved dramatically.*

***I'm really loving these monitors!"***

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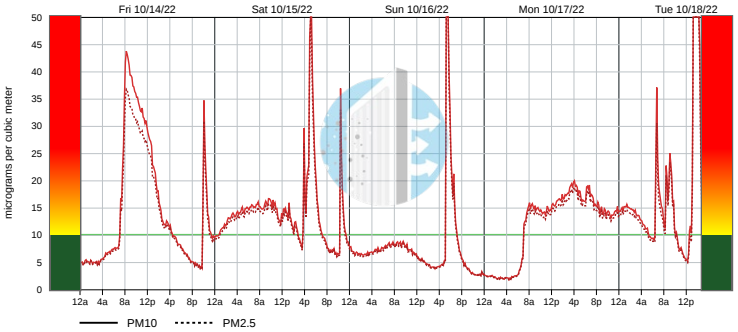
# CASE STUDY TEST RESULTS

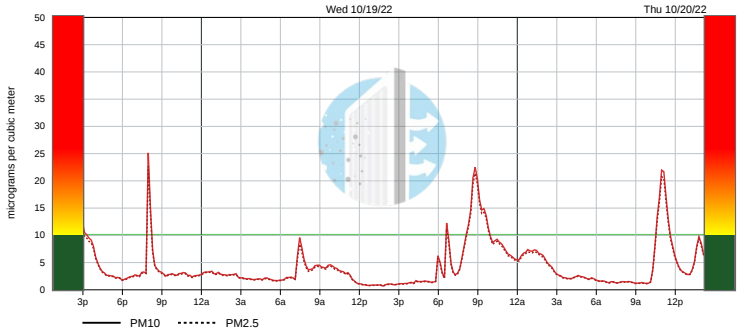
## PARTICLES

### Before




*Highest Daily Average:* **19.5 µg/m³**
*Highest Hourly Average:* **>50.0 µg/m³**
*Overall Average:* **13.5 µg/m³**

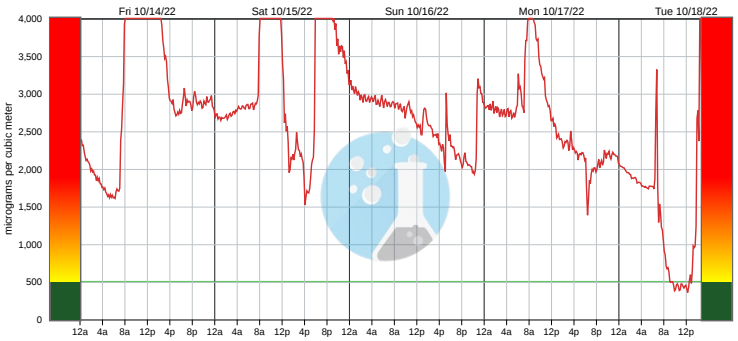
### After




*Highest Daily Average:* **4.4 µg/m³**
*Highest Hourly Average:* **15.2 µg/m³**
*Overall Average:* **4.2 µg/m³**

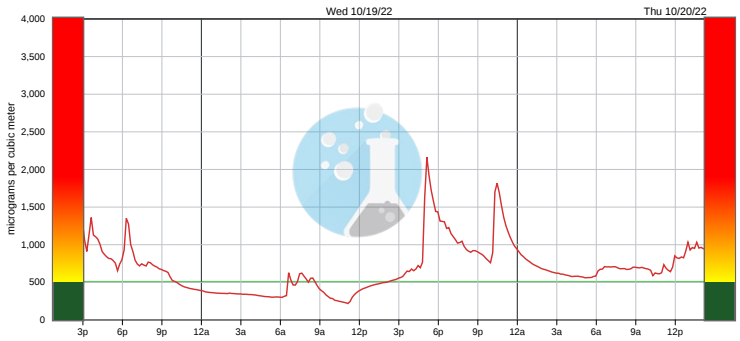
## CHEMICALS

### Before




*Highest Daily Average:* **3717 µg/m³**
*Highest Hourly Average:* **>4000 µg/m³**
*Overall Average:* **2841 µg/m³**

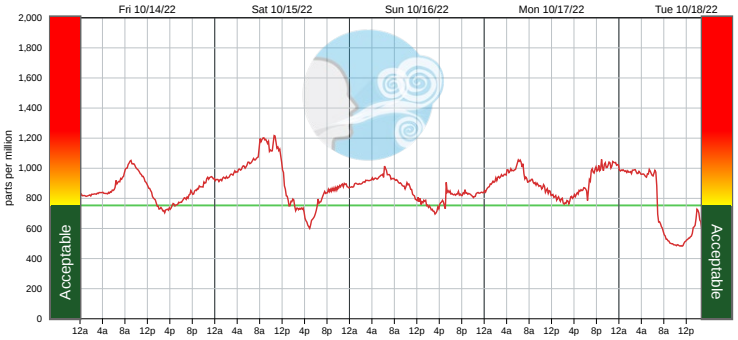
### After




*Highest Daily Average:* **759 µg/m³**
*Highest Hourly Average:* **1726 µg/m³**
*Overall Average:* **681 µg/m³**

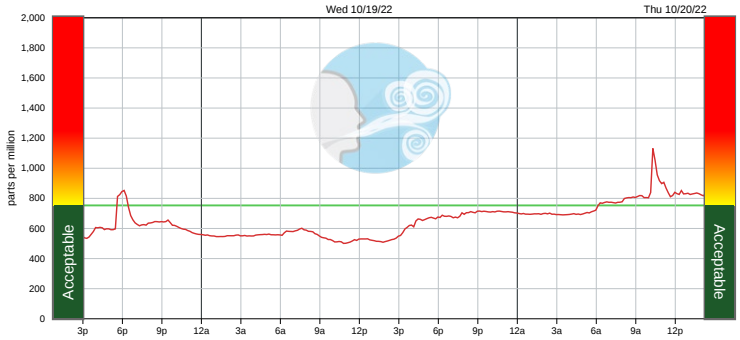
## CARBON DIOXIDE

### Before




*Highest Daily Average:* **915 ppm**
*Highest Hourly Average:* **1181 ppm**
*Overall Average:* **861 ppm**

### After




*Highest Daily Average:* **768 ppm**
*Highest Hourly Average:* **947 ppm**
*Overall Average:* **651 ppm**

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