



Heating & Air Conditioning

Name: Joe & Mary Sample
 Address: 1234 N. Somewhere St.
Tucson, Az 85712

Test-in Date: 4/6/2017
 Report Date: 4/6/2017

***1= Acceptable**

***2= Greater Than but less than Double Outdoor**

***3= Unacceptable**

Thank you for the opportunity to test, assess and inform you of our findings. We performed standard initial testing which included, but not limited to comparing outdoor conditions to indoor conditions of certain criteria and bench mark contaminants.

The Healthier Home Healthier You Program is a program with real time testing performed with the latest technical equipment and recognized acceptable procedures.

	System Location: <u>Whole House</u>		<u>0</u>
	Outdoor	Indoor	Indoor
Temperature(Deg F):	73	72	0
Humidity(%):	19	22	0

The relationship between the Outdoor Contaminants and Indoor Contaminants is very much dependant upon the effective and efficient performance of the Ventilation, Pressure Management and Filtration Systems installed in the home.

Carbon Monoxide(CO):	0	1 * 3	0
Carbon Dioxide(CO2):	596	1040 * 3	0

Carbon Dioxide (CO2) is the natural tracer gas for "Ventilation Effectiveness". The desired reading for your home would be 896 or less. If greater than more Air Exchange is recommended.

Particulates(PM.3):	288500	1233540 * 3	0
Particulates(PM2.5):	8240	15080 * 2	0
Particulates(PM10):	340	940 * 3	0

Report Page 2

Test-in Date: 4/6/2017

Name: Joe & Mary Sample
 Address: 1234 N. Somewhere St.
Tucson, Az 85712

Report Date: 4/6/2017

We measured and assessed the systems with-in your home which influence the Indoor Air Quality. They are, but not limited to, the heating and cooling system (mainly the indoor fan), the exhaust fans and the combination of both. The results are as follows:

With-out System Fan		With System Fan
-1.5	Dryer	1.5
-1.5	Dryer & Hood	0
0	All Bath Fans	0
-1.5	All of the Above	1.5
-0.88	None of the Above	2.8
* 1		

The desired range is < 5 to > 5 on all the measured pressures.

Pressure management with-in the habital space of the home effects "Energy Cost" and "Indoor Air Quality". The greatest effect is caused by excessive duct leakage and driven by the system fan.

Duct leakage was measured, the results as follows:

System Location:	Whole House	0
Total Leakage:	696	* 3
Leakage to Outdoors:	34	* 1
Leakage to Indoors:	662	* 3

Increases Energy Cost
 Adverse Effect on Indoor Air Quality

Duct Cleanliness was tested for Bio-contamination, the results as follows:

Return Air(RLU):	198	* 3	0
Supply Air(RLU):	0	* 1	0

Less than 50 RLU considered clean
 50 RLU to 150 RLU considered dirty

Above 150 RLU's considered contamin

Dust in the home was tested for Bio-contamination and Lead, the results are as follows:

Bio- contamination(RLU): 123 * 3

Above 100 RLU's considered contaminated

Lead(Pb) PPM: 0 * 1 3 PPM or Less Desired

No determined Level of Exposure for Adverse Health E

The indoor environment is always improved with the the following:

- A. Routine house keeping. Routine considered vacuuming, floor cleaning, dusting and general cleaning weekly.
- B. Increased Mechanical Ventilation and Pressure Management.
- C. Improved Filtration.

Acceptable Indoor Air Quality requires contaminant control, effective ventilation and efficient filtration.

Report Page 3

Test-in Date: 4/6/2017

Report Date: 4/6/2017

Name: Joe & Mary Sample
Address: 1234 N. Somewhere St.
Tucson, Az 85712

Findings, comments and recommended improvements:

- A: Found elevated carbon monoxide.
- B: Found elevated carbon dioxide.
- C: Found elevated particulates.
- D: Found dirty duct work and contaminated return duct work.
- E: Found excessive duct leakage.
- F: Found contaminated environmental dust.
- G: Neither bath room has operating exhaust fan.
- H: Kitchen hood is not vented to outdoors.

All found conditions can be improved upon with the following measures. The elevated contamination in the return air and the environmental dust is probably from the large dog in the home.

Recommendations:

- A: Install Delta Breeze Bath / Ventilation fans(2) with humidity control. One in each bath room.
- B: Install Versatile Pressure Management Ventilation Device(PMVD-1) in kitchen / nook area.
- C: Install Ventstar Thermostat with Ventilation Program.
- D: Duct cleaning.
- E: Aroseal duct sealing.
- F: Approximately one week following the repairs, performance testing to validate the improvements.

Recommendations performed complete for the sum of: \$4050.00

**For additional information please contact your Russett Southwest representative Tim Sibley @ 520-490-1504
Building Performance Professional**

Glossary of Selected Contaminants

Glossary of Selected Contaminants and Health Effects

<u>Contaminant</u>	<u>Health Effect</u>
Carbon Monoxide (CO)	<p>Enters the blood stream and reduces the delivery of oxygen to the bodies organs and tissues.</p> <p>Causes fatigue in healthy people</p> <p>Causes chest pains at low concentrations</p> <p>Hazardous to people with heart or cirulatory problems and people who have damaged lungs or breathing passages.</p> <p>Can be fatal</p>
Carbon Dioxide (CO2) (Significant indicator of indoor air quality)	<p>Causes stuffiness and amplifies odors.</p> <p>Causes drowsiness and fatigue.</p> <p>Depletes oxygen.</p>
<p>Particulates (Identified as the most significant indoor contaminant in terms of chronic health impact in residences. The smaller the particulate the greater the health risk)</p>	<p>(PM10) Causes coughing, wheezing and shortness of breath.</p> <p>(PM2.5) Aggravates Asthma, deceases lung function.</p> <p>Can be toxic heavy metals and cancer causing organic compounds.</p> <p>(PM.3) Increases mortality from cardiovascular and respiratory diseases.</p> <p>Ultrafine (UFP)</p>

Glossary of Selected Contaminants

Glossary of Selected Contaminants and Health Effects

Contaminant

Health Effect

Lead(Pb)

Can cause damage to the nervous system, resulting in IQ loss and negative impact on childrens learning, memory and behavior. Can cause cardiovascular, renal and early anemia effects in adults.

Bio-contamination(RLU)

Can cause coughing, wheezing, respiratory illness leading to asthma development. Can cause headaches, fatigue and skin rashes. Can cause neuropsychiatric symptoms and cancer.