

# Appendix B

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Site Investigations

*Industrial Hygiene Report Fire Station No. 9*



**Industrial Hygiene Report**  
**Fire Station #9**  
**March 31, 2003**  
*City Of Long Beach*


**1. BACKGROUND**

Survey conducted at: Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, CA 90807

Job group(s) surveyed: Fire Fighter, Fire Engineer, Fire Captain

Tasks: Review of Medical Records, Facility Inspection, Review  
Of MSDS's, Review of Business Plan, Testing of Water  
Filter

Field work conducted by Michael Alio, Dr. Irene Grace, Jerry Wolfe, Tristina  
Meche

Report reviewed and approved by:   
Michael Alio  
City Safety Officer

Copies provided to: Terry Harbour, Alan Patalano, Dave Ellis, Charlie Hines  
Dan Gooch, Dr. Irene Grace, Kevin Boylan, Reggie  
Harrison

An industrial hygiene survey was conducted at Fire Station #9 following reported episodes of syncope and concern over cancers developed by employees working in the station. The purpose of the survey was to determine if building related issues were causing some of the problems that were reported by employees, especially the syncopal episodes. Four employees were transported to the hospital following syncopal episodes that occurred while employees were in the station. Two employees that worked at Station #9 developed cancers (brain and breast). This issue was reported to Cal/OSHA anonymously by employees and Cal/OSHA has asked the City to provide information on the course of action taken to address the employee concerns. The Fire Department took action in June, 2003, having the ductwork cleaned at the station.

**2. METHODOLOGY**

- Inspection of Station #9 by City Safety Officer Michael Alio and Department Safety Officer Jerry Wolfe on November 19, 2003. Basis of the inspection was to determine possible environmental factors that could be causing the syncope such as mold growth, bacterial growth on water filters, cleaning chemicals, washing of turnouts in

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same machine as clothing, storage of food, possible carbon monoxide or carbon dioxide leakage from the trucks into the station, bird fecal contamination, and prior property usage.

- Inspection of Station #9 by Dr. Irene Grace and City Safety Officer Michael Alio on December 29, 2003. Dr. Irene Grace performed interviews and requested blood work results.
- Record review of Dynamic Imaging's Business Plan, Cleaning Products MSDS's, and Carpet Adhesive MSDS
- Review of blood test results from wellness program by Dr. Irene Grace
- Review of medical records for employees that had syncopal episodes
- Culturing of water filters to identify any harmful bacteria

### **3. RESULTS**

- Inspection on November 19, 2003 revealed the following:
  - Storage of food is within acceptable standards. No issue of cross contamination.
  - No evidence of mold growth was found. All areas of the station were checked including the attic space. No evidence of water leakage or damage was found.
  - Review of MSDS's for chemicals used in the station as well as the carpet adhesive showed that these chemicals would not cause syncopal episodes.
  - Review of Dynamic Imaging's Business Plan showed primary chemical usage consisted of anhydrous ammonia, which would cause immediate burning of the eyes, nose and throat if leakage from the facility was present.
  - Local exhaust filtration system was used, intact, and functional.
  - Turnouts are not washed in the same washing machine as used for clothing and other articles.
  - Water filter change-out schedules were discussed and are current.
  - Large amounts of pine oil cleaners used which is indicated to cause allergies.
  - Slight sewage odor noted though source could not be determined.
  - 4 gas meter, ITX-model, was used to measure carbon monoxide concentrations in all inspected areas. The results were normal.
  - Stagnant drain on north side of station was noted outside with standing water.
- Inspection of December 29, 2003 revealed the following:
  - Two water filters were collected and sent to a lab for bacterial analysis. One filter did not have any bacterial growth. The second filter had the bacteria enterococcus faecium present. This bacteria could cause gastroenteritis, but wouldn't be linked to fainting or dizziness in and of itself. Fainting/dizziness could result from dehydration secondary to gastroenteritis, but symptoms would be more obvious since they would include vomiting and/or diarrhea.
- 18 sets of lab results were reviewed (chemistry panels, cbc's, differentials, cholesterol panels, PSA levels). There was no consistent pattern of significant abnormalities. There were a few results that fell out of the "normal range"; however, none of the minor abnormalities seen on the blood tests would be associated with the symptoms reported – either in a causative factor or as a result of an acute medical condition.

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**Fire Station #9**  
**March 31, 2003**  
*City Of Long Beach*

Minor abnormalities were noted in some of the CBC indices but these were usually less than 1% out of range, which is not clinically significant.

- Review of cancer cases showed on employee with glioblastoma multiforme (brain) and a second with breast cancer. The concern was that these may indicate a cluster. According to the Centers for Disease Control and Prevention, these different types of cancers do not meet the definition of a cancer cluster. Cancer cases are more likely to represent a cancer cluster if they involve: (1) one type of cancer, (2) a rare type of cancer, or (3) a type of cancer in a group not usually affected by that cancer, such as a cancer in children that is normally seen in adults. However, cases of common cancers are those most often perceived and reported by the public as being part of a cancer cluster. The brain and breast cancers are largely hereditary and do not have well defined environmental causes. As with many types of cancer, environmental factors or exposures superimposed upon a genetic predisposition can result in the disease. But without the genetic predisposition, the cancer would not result.
- It was reported that four (4) employees were taken to the emergency room following syncopal episodes. Dr. Irene Grace performed a chart review of records obtained from the emergency room.
  - Employee #1 – history of vasovagal syncope pre-dating employment with the City of Long Beach. Two vasovagal episodes occurred while on duty. Full cardiac work-up proved negative.
  - Employee #2 – diagnosis by the emergency room was anxiety/psychological and not syncope. Hospital noted caffeine and lack of sleep contributed to episode.
  - Employee #3 – employee voluntarily closed file with workers' compensation. No medical records available for review unless employee chooses to release records to the City of Long Beach.
  - Employee #4 – medical records not given to the City of Long Beach by hospital. Employee did not file a claim. Employee would have to release medical records to the City of Long Beach for review.
- Two skin rashes have been reported from employees in Station #9. Occupational Health has seen both employees and noted that the rashes were of different types. It was also noted by Dr. Kenneth Labowe that environmental factors would not cause the types of rashes reported by employee's.
- Review of property usage showed no evidence of pipelines under the station.

## **5. CONCLUSIONS**

At this time, no connection can be made between environmental factors in the station and the cancers/syncopal episodes. The City Safety Officer and Dr. Irene Grace will continue to monitor the situation and take further action as necessary. This report should be distributed to all employees that work in Station #9 15 days after receipt by Fire management.

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**6. RECOMMENDATIONS**

- Fire Department management may request employees that have had syncopal episodes to release the records to Dr. Irene Grace for review to evaluate possible environmental links. This should be done on a voluntary basis.
- Ensure that duct cleaning is completed on annual basis at least (more if conditions warrant) and that system is properly maintained.

*California Division of Occupational Safety and Health Letter*

State of California

Arnold Schwarzenegger, Governor

Department of Industrial Relations

## DIVISION OF OCCUPATIONAL SAFETY AND HEALTH

680 Knox Street, Suite 100

Torrance, CA 90502

Tel # (310) 516-3734

Fax # (310) 516-4253



January 27, 2004

CITY OF LONG BEACH FIRE STATION #9  
3917 LONG BEACH BLVD  
LONG BEACH, CA 90807

Dear Employer:

The Division of Occupational Safety and Health has received a complaint alleging the following condition(s) at your workplace, which may be a violation of the Safety Orders found in Title 8 of the California Code of Regulations.

CODE SECTIONSALLEGED CONDITIONS

T8CCR 5155(c)(1)

Employees passing out, unknown causes.

The Division has not determined whether the hazards, as alleged, exist at your workplace and, at this time, the Division does not intend to conduct an inspection of your workplace.

However, you are required to investigate the alleged condition(s) and notify this Office in writing no later than 14 calendar days after receipt of this letter whether the alleged condition(s) exist and, if so, specify the corrective action(s) you have taken and the estimated date when the corrections will be completed.

Please include any written documentation, e.g., equipment purchase orders or contracts for corrective work, and photographs, if appropriate, in your response. If you do not respond in a timely and satisfactory manner, an unannounced inspection of your workplace will be scheduled which may result in citation(s) and monetary penalties. Also, every tenth satisfactory letter response from employers is subject to verification by an inspection.

You are required to post a copy of this letter and a copy of your response to the Division in a prominent location in your workplace where it is readily accessible for employee review for at least three days or until the hazard is corrected.

This letter is not a citation or a notification of a proposed penalty which can only be issued after an inspection of your workplace. If the Division does not receive a satisfactory response from you within 14 calendar days after receipt of this letter, an inspection will be conducted.

A copy of this letter is being sent to the complainant. Also, the complainant is being notified that California law protects any person who makes a complaint about workplace safety and health hazards from being treated differently, discharged or discriminated against in any manner by their employer. If a complainant believes they have been discriminated against, it is their right to file a complaint with the Division of Labor Standards Enforcement within six (6) months of the discriminatory action.

If you have any questions concerning this matter, please contact me at the address in the letterhead.

Your interest in the safety and health of your employees is appreciated.

Sincerely,

*B. E. McGhee*  
B. E. McGhee  
District Manager

Ref: 77888105-0210 -d

/vh

### *Summary of Employee Health Complaints*



February 9, 2004

State of California  
Department of Industrial Relations  
Division of Occupational Safety and Health  
680 Knox Street, Suite 100  
Torrance, California 90502

*via certified mail*

Attention: B.E. McGhee, District Manager, DOSH

Regarding: Complaint Investigation – Ref.: 77888105-0210-d  
City of Long Beach Fire Station #9 – 3917 Long Beach Blvd.

Dear Mr. McGhee:

In response to the Division's request, we are in the process of performing an investigation into an alleged safety condition as indicated by your letter of January 27, 2004. The following is summary is what has been completed to date:

<b>CODE SECTION</b>	<b>ALLEGED CONDITION</b>
T8 CCR 5155 (e)(1) Airborne Contaminants	Employees passing out, unknown causes

On June 25, 2003, air duct cleaning was completed by Oliver Twist Chimney Sweep and Air Duct Cleaning Inc at Fire Station #9. I have attached a copy of the work performed. Since the work was performed there has not been another instance of employee's passing out.

On November 19, 2003, Department Safety Officer, Jerry Wolfe, and myself completed a walk-through of the building and interviewed some personnel. We looked at all the chemicals used at the facility and found nothing out of the ordinary. There was no water damage or mold growth visible to the naked eye. I checked the water filtration system and the change out schedule for the filters. I requested and reviewed the Business Plan for the printing company next door.

They do not report any chemicals on their plan that would cause the symptoms reported.

On December 29, 2003, I returned for a subsequent visit with our Occupational Health physician, Dr. Irene Grace. Dr. Grace performed interviews and conducted a walk-through of the facility and also found nothing out of the ordinary. Dr. Grace has requested blood work results for those that are housed there and have participated in the Fire wellness plan (where the blood work is conducted). Dr. Grace did not find anything out of the ordinary in the blood work results to indicate a chemical exposure. Dr. Grace is requesting additional medical records for those that were transported to the hospital after their loss of consciousness to look for possible clues in blood work. I am awaiting her findings to determine the next step in the process.

Should you have any questions, please contact me at (562) 570-6476. Thank you for your consideration and for bringing this matter to our attention.

Sincerely,

A handwritten signature in cursive script that reads "Michael Alio". The signature is written in black ink and is positioned above a horizontal line.

Michael Alio, MA, ASP  
City Safety Officer

Attachment

D:\MYDOCUMENTS\SAFETY00\OSHA\_Fire Station#9



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**"The Indoor Air Quality Specialists"**

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To: Ed Nelson

From: Ann Masharo

Date: February 5, 2004

Property Address: LONG BEACH FIRE DEPT., Station 9 (3917 Long Beach Blvd.)

Dear Ed:

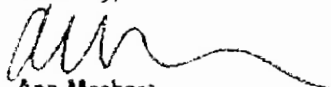
The following air duct cleaning work was completed at the above property address on 06/25/03:

- 1) Air distribution systems and corresponding duct supply outlets to include air ducts will be brush vacuumed clean with our exclusive patented RotoBrush HEPA vacuum and negative air machine.
- 2) We deep clean the source of the air supply including the blower, squirrel cage, coils, condensation pan, and return air supply. All HVAC rooftop units and other are to be deep cleaned and sanitized.
- 3) All register covers and return air grills will be cleaned and sanitized. New pleated filters will be installed.
- 4) Finally, we deodorize & disinfect the ducts with an environmentally safe sanitizer (this will get rid of all mold, fungi, and bacteria on contact). A material safety data sheet is available upon request.
- 5) Leaky air ducts will be sealed to increase efficiency.
- 6) Ripped or torn insulation will be coated with UL-77 to mechanical code standards.

Total fees for the above-mentioned service is \$950.00.

Please feel free to call should you have any further questions.

Sincerely,



Ann Masharo

02/05/2004 10:22

7148990173

OLIVER TWIST CHIMNEY

PAGE 03



See: Captain Mike

Air Duct &amp; Furnace Cleaning

L.B. (562) 595-5122

• Chimney Sweep

O.C. (714) 843-9944

• Dryer Duct Cleaning

S. Bay (310) 377-8163

Service Date: 6/25/03		Day: Wed		A.M. / P.M.: 8:00	
NAME: Long Beach Fire Dept		HOME PHONE: 915 781-209		BUSINESS: 915 781-209	
ADDRESS: 3913 Long Beach Blvd.		CITY: LB		STATE: CA ZIP: 90801	
TODAY'S DATE: 6/25/03		SQ. FT. DWELLING: 1500		UNIT LOCATION: attic	
RETURNS: 3		SUPPLIES: 2 upstairs		#1, #3	
Two Ducts need repair or be replaced Bedrooms / 3 downstairs					
#	FILTER SIZE	#	FILTER SIZE	SERVICE OPTIONS	SERVICE CHARGES
1	14x24			<input checked="" type="checkbox"/> SERVICE OPTIONS CUSTOMER PREFERENCE	\$ and 9.00 to replace
1	14x20			<input type="checkbox"/> AIR SYSTEM - FULL SERVICE	\$ Bad Ducts
1	16x20 in the furnace			<input type="checkbox"/> AIR HANDLER	\$
				<input type="checkbox"/> AIR DUCTS	\$
				<input type="checkbox"/> DECONTAMINATION	\$ 2 ducts in kitchen
				<input type="checkbox"/> DRYER DUCT	\$ will repair & replacement
				<input type="checkbox"/> EXHAUST DUCT	\$
				<input type="checkbox"/> VIDEO INSPECTION	\$
ODOR BLOCK(S)				<input type="checkbox"/> CHIMNEY / FIREPLACE	\$
Additional Information:				<input type="checkbox"/> MAINTENANCE SERVICE	\$
Sealed Ducts at Plenum				<input type="checkbox"/> ELECTROSTATIC FILTERS	\$
Cleaned and Sanitized				<input type="checkbox"/> FILTER SERVICE	\$
All Supply Ducts, Cold Air				<input type="checkbox"/> OTHER (SERVICE SERVICES)	\$
Return Ducts					\$ 950
Installed new Filters					\$
Cleaned and Sanitized					\$
Kitty the attic					\$
Thank you!				Sub Total	\$ 950 -
Sales Tax					\$ -
TOTAL					\$ 950.00
Deposit					\$
Balance Due					\$

How did you hear about us?

☐ Referral☐ Yellow Pages☐ Other

Oliver Twist Representative

Service Technician

Customer Signature

Date 6/25/03

"The Indoor Air Quality Specialists"

## Fire Station #9

**18 sets of lab results** were reviewed (chemistry panels, cbc's, differentials, cholesterol panels, PSA levels). There was no consistent pattern of significant abnormalities. There were some results that fell out of the "normal range" or bell shaped curve, but this is not uncommon.

The concern that was voiced during one of our meetings about CBC "abnormalities" was not validated. There were minor abnormalities in some of the indices (hematocrit, white count, red count, or white cell subtypes) but these were usually less than 1% out of range. Again, not clinically significant.

Conclusion: None of the minor abnormalities seen on the blood tests would be associated with the symptoms the station 9 employees complained of – either in a causative fashion or as a result of an acute medical condition.

**Four cancer cases** –      One employee with glioblastoma multiforme (brain)  
   One employee with breast cancer  
   One other cancer case I can't recall, but you might

For the brain and breast cancers, these are largely hereditary and don't have well defined environmental causes. (As with many types of cancer, environmental factors or exposures superimposed upon a genetic predisposition can result in the disease. But without the genetic part, no cancer would result.)

### **Four reported ER visits:**

**Employee #1** – Admitted history of vasovagal syncope pre-dating employment with CLB. Had 2 vasovagal episodes while on duty; taken to the ER for one incident. Underwent full cardiac work-up which was negative.

**Employee #2** – diagnosis anxiety/psych

**Employee #3** – Workers comp has no records (no ER bill paid, employee voluntarily chose to close file)

**Employee #4** – nothing in workers' comp for past 4 years (2000-2004); nothing in OH file

The **two water filters** were cultured on February 24, 2004. One showed no bacterial growth; the second filter grew enterococcus faecium. This bacteria could cause gastroenteritis, but wouldn't be linked to fainting or dizziness in and of itself. (Fainting/dizziness could result from dehydration secondary to gastroenteritis, but the link would be pretty obvious as the individual would have been vomiting and/or having diarrhea.)

*Indoor Environmental Quality Evaluation with Sampling*

# ***Indoor Environmental Quality Evaluation With Sampling***

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Fire Station No. 9  
3917 Long Beach Boulevard  
Long Beach, California

January 29, 2008  
Bureau Veritas Project Number 25007-007596.00

Prepared for  
**Ms. Rose Siengsubchiarti**  
Safety Specialist, City of Long Beach  
3205 Lakewood Boulevard, M.S. S62-570-2521  
Long Beach, California 90808



For the benefit of business and people

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## **1.0 INTRODUCTION**

Ms. Rose Siengsubchiarti, Safety Specialist with The of the City of Long Beach, retained Bureau Veritas North America, Inc. (Bureau Veritas), to perform an indoor environmental quality (IEQ) evaluation at the Fire Station No. 9 (including living/sleeping quarters, library, kitchen, gym, under floor crawl space, laundry room, roof and attic). The building is located at 3917 Long Beach Boulevard in Long Beach, California. The scope of our services was described in Bureau Veritas Proposal No. 2509.07.178 to Ms. Siengsubchiarti, dated December 17, 2007.

The City of Long Beach requested the IEQ evaluation to respond to air quality concerns regarding diesel exhaust. These concerns have been expressed by employees who work in Fire Station No. 9. The facility is located along a heavily travelled roadway.

Mr. William K. Jones, CIH, CSP, CPE, Senior Consultant of Bureau Veritas, performed the evaluation on January 4, 2008. Ms. Siengsubchiarti and the Fire Station No. 9 Captain (Captain Craig Weismann) provided building access and information during the evaluation. The IEQ evaluation performed by Bureau Veritas included the following tasks:

- Reviewing the uses of the occupied spaces and history of the complaint(s) with Ms. Siengsubchiarti and Mr. Weismann (including past water intrusion/mold growth events).
- Discuss and review the uses of the occupied spaces and history of the IEQ complaint(s).
- Performing a physical and visual inspection of Fire Station No. 9 for factors that may influence indoor air quality, such as sources of internal combustion exhaust inside the building, evaluation of the use of the space and activities performed in the space, and/or sources of potential odors or airborne particulate.
- Performing a visual inspection for evidence of moisture incursion and potential microbial reservoirs and/or amplifiers, and, if present, determine the presence and extent (affected material types and estimated quantities) of impact on construction and finishing materials within the designated suites of the building.
- Where applicable, using a moisture meter to evaluate moisture content in hygroscopic construction and finish materials such as gypsum wallboard, wood framing or studs, or other porous building materials in accessible areas.
- Inspecting the condition of accessible system components of the heating, ventilation, and air-conditioning (HVAC) system servicing the affected area, including air filters, condensate drain pans, cooling coils, ductwork and humidifiers, as applicable.



- Performing direct-reading measurements of indoor air for carbon dioxide (a surrogate measurement used for fresh air mixing in inside areas), carbon monoxide, PM<sub>10</sub> and PM<sub>2.5</sub> particulate (breathable particulate with mean diameters of 10 and 2.5 microns respectively), and temperature and relative humidity throughout the building, and compare findings with the recommendations of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 55-2004, *Thermal Environmental Conditions for Human Occupancy* and ASHRAE Standard 62.1 2007, *Ventilation for Acceptable Indoor Air Quality*.
- Checking relative pressurization relationships and air movement in the breathing zone with air current indicator tubes.
- Collecting up to five airborne diesel exhaust particulate samples, three inside and two outside the building for analysis by the National Institute of Occupational Safety and Health (NIOSH) 5040 method. Samples will be analyzed by a laboratory that is accredited by the American Industrial Hygiene Association (AIHA).
- Reviewing the building's heating, ventilating, and air conditioning system (HVAC) Operation and Maintenance Program.

The IEQ evaluation focused on the overall indoor air quality conditions and factors affecting the conditions at Fire Station 9. Of particular concern to Captain Weismann was the presence of diesel particulate found in a previous study in which bulk samples were taken of the air return filter media.

Appendix A presents the results of the Direct-Reading Environmental Measurements. Appendix B presents the Air Sampling results for Diesel Particulate. Site Photographs are provided in Appendix C. Laboratory Documentation is provided in Appendix D.

This Report has been prepared for the benefit of The City of Long Beach. Only The City of Long Beach may rely on this Report. Any use by any other party does not confer the status of a third party beneficiary and is for informational purposes only. Bureau Veritas shall not be responsible for any damages or losses that result from such unauthorized reliance.

## **2.0 FACILITY DESCRIPTION**

Fire Station No. 9 is a 2-story stucco-frame structure that was built as a WPA project in the 1930s. The building has a wooded floor with an underlying crawl space. Fire Station No. 9 occupies approximately 3,000 square feet (SF) of floor space. The facility is manned 24 hours a day 7 days a week. Typically a crew of six is situated at the facility (i.e., 1 Captain, 2 Firemen, 1 Engineer and 2 Paramedics).



The facility has several rooms used for firefighter sleeping quarters, bathroom, shower area, library/TV room, captain's quarters, kitchen and watchman's office on the first floor. The second floor contains a workout gym, paramedic sleeping quarters, and access to the building roof.

Crawl space vents are protected from water incursion from storms by a footing with concrete masonry walls around the openings. Openings are protected from vermin by welded wire screens. The apparatus area (garage) is a normally unoccupied space (750 SF) that houses the rescue vehicle and pumper engine assigned to the station (as well as other firefighting and personal protective equipment). The attic, accessible from the second floor, houses HVAC equipment, sheet metal ductwork, air conditioning condenser, and furnace.

The roof is mostly a steeply pitched composite shingle roof. The pitch flattens on the southwest portion of the roof (to accommodate mounting of the 48,000 BTU air conditioning unit). The flatter portion of the roof is a vinyl material with good drainage. The building is equipped with rain gutters to remove standing water.

Fire Station 9 is located in a suburban area of the City of Long Beach. The building is on Long Beach Boulevard (a busy 4 lane road). The station borders an upper middle class neighborhood with an apartment building across the street and single family dwellings around the corner. The building itself has concrete with apparently good drainage on all 4 sides of the structure.

### *Building Exterior Inspection*

The front and back doors of the facility appear to seal well and windows were in good condition. First floor windows in the kitchen and the Captain's Quarters can be opened to provide natural ventilation. The kitchen windows are routinely kept open. No apparent sources of stagnant or pooling water were observed outside the building. No apparent sources of water incursion (i.e., cracks) were noted along the building exterior walls at the time of our inspection.

The roof access (via the second floor stair landing) showed signs of past water incursion (refer to Photo No. 1 in Appendix C). The access door to the building roof is an interior hollow core design and construction. (refer to Photo No. 1 in Appendix C).

## **3.0 OBSERVATIONS AND DISCUSSION**

The IEQ evaluation included the previously described occupied spaces of Fire Station No. 9. Our observations and discussions are based on (1) inspection of these areas throughout the occupied spaces, (2) inspection of accessible components of the ventilation systems serving the occupied spaces, (3) measurements of carbon monoxide,



carbon dioxide and respirable particulate concentrations and temperature and relative humidity levels indoors in representative occupied spaces and in the outdoor air, (4) measurement of relative air pressurization, and (5) results of air sampling for diesel particulate.

### **3.1 OCCUPIED SPACES**

The interior construction materials for First Station No. 9 included primarily walls of painted lath and plaster construction; textured drywall ceilings, and flooring consisting of carpet over raised wooden floors. The upper four (4) feet of the second floor walls has been rebuilt using drywall construction, but the majority of the interior walls are lath and plaster.

The overall condition of Station 9 was assessed as part of this evaluation. Bureau Veritas noted the following during its walkthrough of the building:

- No odors atypical to an office or living area environment in the occupied spaces at the time of this evaluation.
- Visible water stains affecting approximately 3 SF of plaster wall and 4 SF of hollow core door at the roof access on the second floor (refer to Photo No. 1, Appendix C). An area in the second floor gym (6 SF) of drywall shows signs of past water incursion from a roof leak (refer to Photo No. 7, Appendix C). Bureau Veritas did not observe any signs of mold growth in these areas, nor did we detect any signs of elevated moisture content in these materials. Captain Weismann reported that a past the roof leak in this area was subsequently repaired.
- Housekeeping throughout the occupied spaces evaluated appeared to be adequate. Horizontal surfaces were observed to be relatively free of accumulations of dust.

### **3.2 HEATING, VENTILATING AND AIR-CONDITIONING SYSTEMS**

Fire Station No. 9 is provided with heating and ventilation via an (approximately 15-year-old) Rheem 48,000 BTU unit. The conditioning components are located on the roof (refer to Photo No. 6 in Appendix C). The condenser, condensate drain pan, supply and return air ducts, and gas furnace are all located in the attic space above the second floor (refer to Photo No. 4 in Appendix C).

There was no standing water or visible mold growth observed in the condensation pan or systems. The condensate drain pan was rusted, indicating historical condensation accumulation (refer to Photo No. 5 in Appendix C). The HVAC air filter was in acceptable condition, but was not properly seated and may allow unfiltered air to circumvent the filter (refer to Photo No. 2 in Appendix C). A first floor return air register was opened and the filter inspected. The filter was dirty, but there were no signs of mold growth or breakthrough with the filter.



It does not appear that there is a fresh air intake designed into the HVAC system. Fresh air is supplied to the building via doors and window openings in the structure. Captain Weismann reported that there was apparently no formal preventative maintenance (PM) program for the HVAC systems in place at this time.

### **3.3 CRAWL SPACE INSPECTION**

At the request of Captain Weismann, an inspection of the building's under-floor crawl space was conducted. The soil underneath the Fire Station No. 9 floor was dry. Other than scattered spider webs, no signs of animals were observed. No standing water or signs of water leaks were apparent in the vicinity of the plumbing drains for the kitchen and first floor bathrooms.

### **3.4 RELATIVE PRESSURIZATION RELATIONSHIPS**

Bureau Veritas checked relative air pressurization relationships in the building using smoke tubes. Occupied indoor spaces that are under a negative pressure relative to the outdoors during times when the ventilation system is in the cooling mode are considered as undesirable from an IEQ standpoint in that this condition may facilitate the inward migration of high moisture laden air from the outdoors. The HVAC system was not operating during the IEQ evaluation period. The relative pressurization observations made when the HVAC was not running revealed the following:

- The building was under neutral pressure with respect to the outdoors. Smoke tubes at the front door did not demonstrate an outward or inward flow of air. These measurements are due to the lack of mechanical outdoor air ventilation provided for this facility.
- There was no noticeable natural air flow within the first floor hallway or from room to room. Smoke hung in the air when emitted from the smoke tube. These measurements are likely due to the fact that the HVAC unit was not operating during the survey period.

### **3.5 DIRECT-READING ENVIRONMENTAL MEASUREMENTS**

Direct-reading environmental measurements at selected indoor locations and in the outdoor air were collected on January 4, 2008. Bureau Veritas measured temperature, relative humidity and carbon dioxide and carbon monoxide concentrations using a TSI Q-Trak™ Model 8551 direct-reading instrument. Airborne particulate concentrations were measured using a TSI, Inc. Dust Trak. direct-reading dust/aerosol monitor. The unit used two different particle size separators to measure airborne particulate matter with a particle sizes 10 micron and smaller and 2.5 microns and smaller. Appendix A presents direct-reading environmental measurements.



### 3.5.1 Dry Bulb Temperature and Relative Humidity

Bureau Veritas performed direct-reading environmental measurements at selected indoor locations for relative humidity (RH) to evaluate if the space was over humidified. Excess indoor humidity can contribute to mold growth on organic materials if the RH remains elevated.

ASHRAE Standard 62.1-2007, *Ventilation for Acceptable Indoor Air Quality*, recommends that, to avoid mold amplification in building fabrics, relative humidity in occupied spaces should be maintained below 65%.

The relative humidity inside Fire Station No. 9 ranged from 56.9-70.6% and the temperature ranged from 65.9- 67.4°F. The relative humidity outdoors ranged from 56.6-62.0% and the temperature ranged from 58.6-64.0°F. The indoor humidity readings suggest that conditions if prevalent could be conducive to fungal growth on building materials as the result of elevated indoor humidity.

ASHRAE Standard 55-2004, *Thermal Environmental Conditions for Human Occupancy*, suggests that there are six primary factors that must be addressed and/or measured when defining conditions for thermal comfort for building occupants. These include: 1) metabolic rate, 2) clothing insulation, 3) air temperature, 4) radiant heat, 5) air speed and 6) relative humidity. It is beyond the scope of this baseline evaluation to address all six factors. However, Bureau Veritas collected measurements of temperature and relative humidity as a screening tool to assess the thermal comfort of employees.

Metabolic rate and clothing insulation factors are generally considered to be outside the control of the building operators. The indoor temperatures and relative humidity levels recommended by ASHRAE in Standard 55-2004 change from warmer to cooler weather depending on clothing factor. Satisfactory conditions are defined by the ASHRAE as when a substantial majority of occupants (80 % or more) are not expressing dissatisfaction with thermal comfort.

The acceptable temperature ranges presented below take into account both the comfort aspects presented in ASHRAE 55-2004 and the maximum relative humidity aspect cited in ASHRAE 62.1-2007. The outdoor environment parameter takes into account the thermal insulation of clothing typically worn based on outdoor temperatures (e.g., heavier clothing in the winter and lighter clothing in the summer).

Relative Humidity	Temperature Range (°F)	
	Warm Outdoor Environment	Cool Outdoor Environment
60%	75 to 81	68 to 76
40%	76 to 81	69 to 76
20%	77 to 82	70 to 78



### 3.5.2 Carbon Dioxide

ASHRAE Standard 62.1-2007 gives specific design criteria for determining the ventilation rates for different types of facilities. The standard calls for outdoor air supply requirements based on the usage of the space, the occupant density and the square footage of the space. It is our understanding that the Fire Station No. 9 indoor area is 3,000 SF with an attached apparatus area (i.e. garage) that is approximately 750 SF. There are usually employees occupying the station. For a building with this low occupancy rate, the normally referenced Table 6.1 of ASHRAE 62.1-2007 makes no recommendation. A CO<sub>2</sub> concentration in occupied office spaces of no greater than 800 ppm above the outdoor air concentration as the reference or maximum desirable concentration. This CO<sub>2</sub> maximum is based on Appendix C of ASHRAE Standard 62.1-2007.

In this evaluation the carbon dioxide (CO<sub>2</sub>) concentration was used to estimate the outside air ventilation rate. Carbon dioxide is a useful surrogate measure of the amount of outside air ventilation. By itself, carbon dioxide has little effect on indoor air quality. It is colorless, odorless, and tasteless. The source of the indoor CO<sub>2</sub> is the occupants' exhaled breath. An indoor carbon dioxide concentration of 800 ppm above the outdoor concentration is not a significant risk to health; however, bioeffluents from occupants and pollutants from building components may accumulate to irritant levels or result in discomfort for the occupants due to inadequate ventilation. Maintaining an indoor carbon dioxide concentration of less than 800 ppm above outdoor concentrations will generally result in satisfactory perception of comfort for the majority of occupants.

On the day of Bureau Veritas' evaluation, an average outdoor CO<sub>2</sub> concentration of 422 ppm was measured. Therefore, an indoor concentration of 1,222 ppm (800 ppm + 422 ppm) CO<sub>2</sub> or less will meet the targeted CO<sub>2</sub>. The results of indoor carbon dioxide concentration measurements ranged from 405 - 653 ppm with an average CO<sub>2</sub> concentration of 545 ppm. All concentrations measured in the indoor spaces on the day of the assessment were lower than the respective ASHRAE-recommended indoor carbon dioxide concentrations (although this is related to outdoor air provisions via natural means and not mechanical means).

### 3.5.3 Carbon Monoxide

Bureau Veritas measured indoor carbon monoxide (CO) concentrations and outdoor CO concentrations for comparison to evaluate whether indoor carbon monoxide concentrations approached established exposure limits. Carbon monoxide is an odorless, colorless, toxic gas produced by the incomplete combustion of solid, liquid, and gaseous fuels. Elevated indoor CO concentrations may be a result of combustion sources indoors or the introduction of combustion products from outdoors into the indoor air. In the absence of indoor sources, indoor CO concentrations are typically less than, or equal to, outdoor concentrations.





The United States Environmental Protection Agency (USEPA) provides for exposure limits to a limited number of substances for the general population and the outdoor environment. These limits are commonly known as National Ambient Air Quality Standards (NAAQS). These limits are often applied to the indoor non-industrial environment by professionals with the thought that the indoor air quality should not be worse than the outdoor air quality. The NAAQS for CO is 9 parts per million (ppm) as an 8-hour average and 35 ppm as a one-hour average.

The California Occupational Safety and Health Administration (Cal/OSHA) promulgates regulations aimed at providing a safe and healthful workplace. In this role, Cal/OSHA has specified Permissible Exposure Limit Time-Weighted Average (PEL-TWA) concentrations for employees working in general industry under Title 8 of the California Code of Regulations, Table CA1, *Air Contaminants*. The Cal/OSHA 8-hour PEL-TWA for CO is 35 ppm. The American Conference of Governmental Industrial Hygienists (ACGIH) has also specified, although not required by law, Threshold Limit Value Time-Weighted Average (TLV-TWA) concentrations. The ACGIH 8-hour TLV-TWA for CO is 25 ppm.

Bureau Veritas measured eight instantaneous indoor CO concentrations in five different locations. CO levels ranged from 1 ppm or less in all areas. The results of measurements for CO suggest that employees' exposures to CO were likely to remain well below the OSHA and ACGIH occupational exposure limits and the NAAQS for CO. The indoor CO levels were similar to the outdoor background levels of CO. The most probable sources of the indoor CO are the ambient outdoor air and the operation of the rescue and engine vehicles.

### **3.5.4 Particulate Matter**

Bureau Veritas collected direct-reading measurements for airborne concentrations of inhalable coarse particles between 2.5 to 10 microns ( $\mu\text{m}$ ) in diameter ( $\text{PM}_{10}$ ), and airborne concentrations of fine particles with an average diameter of less than 2.5  $\mu\text{m}$  ( $\text{PM}_{2.5}$ ), to evaluate whether concentrations of these dust particles likely approached established ambient air quality limits.

The term particulate includes both solid particles and liquid droplets found in air. Many manmade and natural sources emit particles directly or emit other pollutants that react in the atmosphere to form particulates. These solid and liquid particles come in a wide range of sizes. Particles  $\leq 10 \mu\text{m}$  ( $\text{PM}_{10}$ ) pose a potential health concern because they can be inhaled into and accumulate in the respiratory system. Sources of these fine particles include all types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. Particles with diameters between 2.5 and 10 micrometers are referred to as "coarse." Sources of coarse particles include crushing or grinding operations, and dust from paved or unpaved roads. The NAAQS for  $\text{PM}_{10}$





is 50 micrograms per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ) as a one-year average and  $150 \mu\text{g}/\text{m}^3$  as a 24-hour average. The NAAQS for  $\text{PM}_{2.5}$  is 15 micrograms per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ) as a one-year average and  $37 \mu\text{g}/\text{m}^3$  as a 24-hour average.

A summary of the results of the instantaneous measurements for particulates is presented in the following table. The results of the measurements suggest that employees' were not likely to be exposed to airborne concentrations of  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  above the NAAQS.

Locations	Instantaneous Concentrations of $\text{PM}_{10}$ Range/Average ( $\mu\text{g}/\text{m}^3$ )	Instantaneous Concentrations of $\text{PM}_{2.5}$ Range/Average ( $\mu\text{g}/\text{m}^3$ )
Indoors	10-94 / 30	7 - 80 / 19
Outdoors	16 - 18/17	8 - 12 / 10

$\text{PM}_{10}$  = Particulate matter less than 10 microns in diameter  
 $\text{PM}_{2.5}$  = Particulate matter less than 2.5 microns in diameter  
 $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter of air

The results of measurements suggest that employees were at alternating times exposed to airborne concentrations of  $\text{PM}_{10}$  greater than and lower than the outdoor background concentrations of  $\text{PM}_{10}$  and that outdoor background concentration of  $\text{PM}_{10}$  would not have exceeded the NAAQS if they remained at the measured concentrations for 24-hours.

The library/TV room had the highest instantaneous indoor concentrations of  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  at  $94$  and  $80 \mu\text{g}/\text{m}^3$ , respectively. It is Bureau Veritas' opinion that the transient higher levels of  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  in this room were likely very transient and could possibly have been a result of the movement of this investigator when conducting measurements.

It is our opinion that the sources of the indoor particulate matter is a combination of the background ambient outdoor levels entering into the building, particulate matter generated by the fact that the building is occupied and that the floors are carpeted.

### 3.6 MOISTURE CONTENT SURVEY

Bureau Veritas used a Tramex® Survey Encounter and a Delmhorst® Model BD 2100 moisture meter to measure the relative moisture content (MC) of the lath and plaster and gypsum wallboard materials in areas that had evidence of past water intrusion and in random areas in the station. The Tramex® meter measures the presence of moisture in a building material by detecting difference in electrical impedance. The inference being that a wet material more readily conducts electricity than a dry material of a similar type because water is a good electrical conductor. The meter measures electrical impedance up to a depth of approximately one inch and is non-invasive or destructive to materials



being measured. A limitation of this meter is that metal materials, which are good electrical conductors, hidden within wall cavities (such as metal studs, nails and conduit) can cause a false-positive reading (e.g., indicate that the material is wet when it is dry).

To re-examine potential false-positive readings associated with the Tramex® measurements, confirmatory readings were collected using the Delmhorst® instrument. The Delmhorst® instrument measures the electrical conductivity of building materials utilizing 3/8" invasive metal pins and could not penetrate the plaster or concrete walls in the north wall of the watchman's office where a higher reading had been made (see discussion below).

Bureau Veritas obtained direct-reading relative moisture measurements from plaster and gypsum wallboard in the following locations:

- The relative MC measurements of the gypsum wallboard in the west, north and east walls of the watchman's office. Readings ranged from 20–40 on the east and west walls (40 was the reading taken as a “dry” reference reading on the plaster wall in the first floor inside hallway). The north wall had an elevated reading of 56. This was investigated by visual inspection on both sides of the wall. There were no signs of moisture incursion observed. The plaster on the north wall abuts against a poured concrete wall that likely has steel reinforcing bar. We were unable to use the Delmhorst meter to investigate the high reading since the plaster wall could not be penetrated by the meter's pins. However in absence of visible signs of water incursion and with the poured concrete wall next to the plaster, Bureau Veritas does not believe there is a condition conducive to mold growth in the watchman's office.
- A relative MC measurement of the gypsum wallboard in the second floor gym where a past roof leak had occurred was made. A reading of 14 was observed with the Tramex instrument. This was actually lower than the reference plaster reading. Bureau Veritas does not believe there is a condition conducive to mold growth in the drywall of the gym.
- A relative MC measurement was made of the south plaster wall below the roof access door. This reading measurement was 42, again not elevated above the reference reading on the plaster. Although it appears that there is an opportunity for moisture incursion via the roof access, the plaster did not appear to have a problem that could result in mold growth.

#### **4.0 AIR SAMPLING FOR DIESEL PARTICULATE**

Bureau Veritas collected air samples to measure levels of diesel particulate that might be present (due to city traffic and operation of the facility vehicles). Air Samples were collected and analyzed using National Institute for Occupational Safety and Health



(NIOSH) Method No. 5040. The samples were sent to our Novi, Michigan laboratory for analysis. The Bureau Veritas laboratory is accredited by the American Industrial Hygiene Association (AIHA).

Bureau Veritas collected air samples from 5 locations using battery-powered sampling pumps and 37-mm diameter quartz fiber filters. Samples were collected in the kitchen, Captain's quarters, hallway by the firemen's sleeping quarters, the building roof, and outside the building entrance. Laboratory analytical results are presented in Table B-1 (Appendix B).

Analytical results indicate that levels of diesel particulate (elemental carbon) were generally below the analytical limit of detection. A trace level of elemental carbon was found in the kitchen area sample. Levels of elemental carbon (EC) ranged from <4.3 to <6.7 micrograms per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ) in the air samples. The EC levels are well below the current Mine Safety and Health Administration (MSHA) limit of  $308 \mu\text{g}/\text{m}^3$ . The MSHA limit is not applicable to the Fire Station No. 9 facility (it applies to surface/underground metal/non-metal mining operations).

The California Occupational Safety and Health Administration (Cal/OSHA) and Federal OSHA have not established any permissible exposure limits (PELs) for diesel particulate at this time. The American Conference of Governmental Industrial Hygienists (ACGIH) has not recommended a Threshold Limit Values (TLVs) for diesel particulate at this time. A summary of the occupational exposure limits for diesel particulate are provided in the table below:

#### Occupational Exposure Limit for Diesel Particulate

Compound	Cal/OSHA PEL ( $\mu\text{g}/\text{m}^3$ )	ACGIH TLV ( $\mu\text{g}/\text{m}^3$ )	USEPA NAAQS ( $\mu\text{g}/\text{m}^3$ )	MSHA PEL TWA ( $\mu\text{g}/\text{m}^3$ )
Diesel Particulate as Elemental Carbon	NE	NE	NE	308

Cal/OSHA PEL: California Occupational Safety and Health Administration Permissible Exposure Limit  
ACGIH TLV: American Conference of Governmental Industrial Hygienists Threshold Limit Values  
USEPA NAAQS: United States Environmental Protection Agency, National Ambient Air Quality Standards  
 $\mu\text{g}/\text{m}^3$ : Micrograms per cubic meter of air  
STEL: Short Term Exposure Limit  
NE: Not Established

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

Bureau Veritas' conclusions and recommendations are based on its observations, including visual surveys and inspections, and analytical results of the air sampling conducted during this evaluation.



## 5.1 CONCLUSIONS

There are no applicable federal, state or local limits developed at this time regarding airborne concentrations of diesel particulate. There is a MSHA PEL for an 8-hour average exposure to elemental carbon from diesel particulates. This is for a workday exposure of miners to the diesel equipment operations.

However, due to low average PM<sub>2.5</sub> and PM<sub>10</sub> particulate concentrations, carbon monoxide concentrations and elemental carbon, Bureau Veritas believes that the diesel and other internal combustion sources are not generating unacceptable levels of pollution in the Station 9 environment.

Bureau Veritas cannot provide medical opinion regarding whether occupants experiencing any health-related symptoms can safely occupy the facility. An occupational physician can provide such medical opinion on a case-by-case basis after examining occupants who have experienced health-related symptoms. Our findings may be useful to the occupational physician in determining if any occupant complaints are building-related.

Direct-reading measurements indicated conditions which generally met respective ASHRAE recommendations for the indoor environment on the day of this evaluation. Two of the 9 humidity measurements were 6 percentage points higher than the desired, but the rest were within the recommended parameters and rain was imminent the day of the survey. Additionally, one of the 19 particulate measurements was slightly higher than the NAAQS number. Bureau Veritas does not believe either excursion is significant. Most indoor temperature and relative humidity readings indicate conditions that are likely to be comfortable for the majority of occupants who dress for the season and activity levels and indicate acceptable levels of dusts and combustion by-products.

Pressurization relationships were not adequately evaluated as the HVAC system was not running at the time of the survey. However, it was noted that there was very little natural air movement within the first floor hallway. This could lead to a perceived lack of fresh air among occupants.

There is apparently no preventive maintenance schedule on the HVAC system. Captain Weismann changes filters on the unit. The filter in the condenser unit itself does not appear to seat properly, allowing air circumvent the filter.

Bureau Veritas observed past moisture incursions on the second floor gym and roof access areas. No apparent high moisture levels or visible evidence of mold growth remained in the areas affected. One moisture incursion source has been corrected according to Captain Weismann. The other area, the roof access, has not been corrected.




## 5.2 RECOMMENDATIONS

Bureau Veritas presents the following recommendations to the City of Long Beach for their consideration and to assist them in improving the Building IEQ.

- Incorporate provisions for outdoor air into the HVAC air handling systems. All incoming air to the building should pass through the air handling systems. Opening of perimeter windows to provide natural ventilation should be prevented.
- Operate the building to maintain positive pressurization of the indoor space to minimize the potential migration of unfiltered and unconditioned air from outdoors to indoors. Providing outdoor air provisions for the HVAC system should address this problem. The facility should consider operating the HVAC system in the continuous fan running mode to maintain adequate air circulation within the building.
- Ensure the HVAC system air filter is properly seated within the unit.
- Establish a preventive maintenance (PM) program for the HVAC system which includes regular cleaning of the units cooling coils, inspection of ducts, and condensation pans.
- Replace roof access door with an appropriately sealing exterior door.
- Ensure that exhaust fans in the kitchen and restrooms are operating as designed.


This report submitted by:



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William K. Jones, CIH, CSP, CPE  
Senior Consultant  
**Bureau Veritas North America, Inc.**  
*Health, Safety, and Environmental Services*  
Southwest Regional Office

This report reviewed by:



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Brad J. Gilbert, CIH, CSP, CHMM, P.Eng.  
Senior Project Manager  
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*Health, Safety, and Environmental Services*  
Atlanta Regional Office

January 29, 2008  
Bureau Veritas Project No. 25007-007596.00



## **APPENDIX A**

### **DIRECT-READING ENVIRONMENTAL MEASUREMENTS**



Table A-1

**Results of Direct-Reading Environmental Measurements  
City of Long Beach Fire Station No. 9  
Long Beach, California  
Date of Sampling: January 4, 2008**

Location	Time	Carbon Monoxide (ppm)	Carbon Dioxide (ppm)	Dry Bulb Temp. (F)	Relative Humidity (%)	PM <sub>10</sub> /PM <sub>2.5</sub> (µg/m <sup>3</sup> )
Garage/ Apparatus Area	1052 Engine Started	1	616	65.8	56.9	41/7
	1108 Engine returns	0-1	424	64.5	58.3	13/10
	1211 Rescue returns	0	--	--	--	--/11
	1229 Engine returns parked on drive	0	405	65.7	59.4	12/11
Outside Front Porch	1101	1	421	58.6	56.6	16/8
	1348	0	422	64	62	18/12
Hallway Next To Sleeping Quarters	1056	0	481	65.9	56.9	12/8
Library/TV Room	1352	1	653	65	70.4	94/80
Captain's Quarters	1104	0	656	64.7	62.2	10/9
Kitchen	1355	0	583	67.4	70.6	26/17
<b>Recommended IEQ Criteria</b>	--	<b>&lt;9</b>	<b>&lt; (800 + outdoor level)</b>	<b>*</b>	<b>&lt;65</b>	<b>150/37</b>

ppm: Parts per million  
%: Percent

F: Degrees Fahrenheit  
µg/m<sup>3</sup> microgram per cubic meter of air

PM<sub>10</sub> Particulate matter between >2.5 and ≤10 microns  
PM<sub>2.5</sub> Particulate matter ≤2.5 microns in diameter

Note: Carbon Monoxide, Carbon Dioxide, Temperature, and Relative Humidity measurements were collected with a TSI IAQ-Calc 8762 instrument. Particulate concentrations were collected with a TSI Dust Trak Model 8520 instrument.



## **APPENDIX B**

### **AIR SAMPLING FOR DIESEL PARTICULATE**





**Table B-1**

**Results of Air Sampling for Diesel Particulate (Elemental Carbon)  
City of Long Beach Fire Station No. 9  
Long Beach, California  
Date of Sampling: January 4, 2008**

<b>Sample Date</b>	<b>Sample Number</b>	<b>Sampling Description</b>	<b>Sampling Period (Start/Stop)</b>	<b>Total Time (min)</b>	<b>Sample Air Volume (Liters)</b>	<b>Elemental Carbon Measured Concentration (<math>\mu\text{g}/\text{m}^3</math>)</b>
1/4/08	4722	Rain gutter on front porch – Area Sample	1039/1304	145	300.3	<6.7
1/4/08	4715	Outside on roof – Area Sample	1042/1306	144	296.8	<6.7
1/4/08	4721	Kitchen cabinet	1045/1430	225	487.4	4.9
1/4/08	4717	Captain's Office/Quarters – Area Sample	1046/1426	220	459.9	<4.3
1/4/08	4716	Hallway by sleeping quarters – Area Sample	1410/1418	219	433.4	<4.6
1/4/08	4719	Field Blank	-----	-----	-----	<2 $\mu\text{g}$
MSHA Limit (Mining Operations) (No Cal/OSHA, OSHA, or other limits in place at this time)						308



## **APPENDIX C**

### **SITE PHOTOGRAPHS**



<b>Subject</b>	Roof Access Water Incursion	<b>Bureau Veritas Project No.</b> 25007- 007596.00	<b>1</b>
<b>Site</b>	Station 9		<b>Date</b> 01/04/08
<b>Client</b>	City of Long Beach		



<b>Subject</b>	Filter Seat	<b>Bureau Veritas Project No.</b> 25007- 007596.00	<b>2</b>
<b>Site</b>	Station 9		<b>Date</b> 01/04/08
<b>Client</b>	City of Long Beach		



<b>Subject</b>	Ducted Return Register	<b>Bureau Veritas Project No.</b> 25007- 007596.00	<b>3</b>
<b>Site</b>	Station 9		<b>Date</b> 01/04/08
<b>Client</b>	City of Long Beach		



<b>Subject</b>	Furnace and Plenum	<b>Bureau Veritas Project No.</b> 25007- 007596.00	<b>4</b>
<b>Site</b>	Station 9		<b>Date</b> 01/04/08
<b>Client</b>	City of Long Beach		





<b>Subject</b>	Condensation Drain Pan	<b>Bureau Veritas Project No.</b> 25007- 007596.00	<b>5</b>
<b>Site</b>	Station 9		<b>Date</b> 01/04/08
<b>Client</b>	City of Long Beach		



<b>Subject</b>	HVAC Exterior Cooling Coils	<b>Bureau Veritas Project No.</b> 25007- 007596.00	<b>6</b>
<b>Site</b>	Station 9		<b>Date</b> 01/04/08
<b>Client</b>	City of Long Beach		



<b>Subject</b>	Water Damage in Gym	<b>Bureau Veritas Project No.</b> 25007- 007596.00	<b>7</b>
<b>Site</b>	Station 9		<b>Date</b> 01/04/08
<b>Client</b>	City of Long Beach		



## **APPENDIX D**

### **LABORATORY DOCUMENTATION**



January 23, 2008

William Jones  
BUREAU VERITAS - COSTA MESA  
15491 Ridgecrest Lane  
Chino Hills, CA 91709-

Bureau Veritas Work Order No. 08010117

Reference: 25007-007596.00/CITY OF LONG BEACH FIRE DEPARTMENT

Dear William Jones:

Bureau Veritas North America, Inc. received 6 samples on 1/8/2008 for the analyses presented in the following report.

This is a revised report. Please see the Case Narrative for details.

This material is confidential and is intended solely for the person to whom it is addressed. If this is received in error, please contact the number provided below.

We appreciate the opportunity to assist you. If you have any questions concerning this report, please contact a Client Services Representative at (800) 806-5887.

Sincerely,

Sharon M Johnson  
Client Services

cc:



## **CASE NARRATIVE**

**Date: 23-Jan-08**

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**Client: BUREAU VERITAS - COSTA MESA**

**Project: 25007-007596.00/CITY OF LONG BEACH FIRE DEPARTMENT**

**Work Order No 08010117**

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### **Revised Report:**

As discussed on January 23, 2008 the air volumes have been changed.

Unless otherwise noted below, all quality control results associated with this sample set were within acceptable limits and/or do not adversely affect the reported results.

Unless otherwise indicated below, the industrial hygiene results have not been blank corrected.

Analytical Comments for Method OCEC, sample -006A: Actual value of client organic carbon blank; results have been blank corrected.

# ANALYTICAL RESULTS

Date: 23-Jan-08

Client: BUREAU VERITAS - COSTA MESA

Project: 25007-007596.00/CITY OF LONG BEACH FIRE DEPARTMEN

Work Order No: 08010117

Client ID: 4722

Date Sampled: 1/4/2008

Lab ID: 001A

DateReceived: 1/8/2008

Matrix: Quartz Filter

Air Vol.(L): 300.3

Analyte	Concentration		Reporting	Test	Date Analyzed / Analyst	
	(µg)	(mg/m³)	Limit (µg)			
Elemental Carbon	<2	<0.0067	2	NIOSH 5040	01/14/2008	CLH
Organic Carbon	<2	<0.0067	2	NIOSH 5040	01/14/2008	CLH
Total Carbon	<4	<0.013	4	NIOSH 5040	01/14/2008	CLH

Client ID: 4715

Date Sampled: 1/4/2008

Lab ID: 002A

DateReceived: 1/8/2008

Matrix: Quartz Filter

Air Vol.(L): 296.8

Analyte	Concentration		Reporting	Test	Date Analyzed / Analyst	
	(µg)	(mg/m³)	Limit (µg)			
Elemental Carbon	<2	<0.0067	2	NIOSH 5040	01/14/2008	CLH
Organic Carbon	5.1	0.017	2	NIOSH 5040	01/14/2008	CLH
Total Carbon	5.1	0.017	4	NIOSH 5040	01/14/2008	CLH

Client ID: 4721

Date Sampled: 1/4/2008

Lab ID: 003A

DateReceived: 1/8/2008

Matrix: Quartz Filter

Air Vol.(L): 487.4

Analyte	Concentration		Reporting	Test	Date Analyzed / Analyst	
	(µg)	(mg/m³)	Limit (µg)			
Elemental Carbon	2.4	0.0049	2	NIOSH 5040	01/14/2008	CLH
Organic Carbon	37	0.076	2	NIOSH 5040	01/14/2008	CLH
Total Carbon	39	0.081	4	NIOSH 5040	01/14/2008	CLH

# ANALYTICAL RESULTS

Date: 23-Jan-08

Client: BUREAU VERITAS - COSTA MESA

Project: 25007-007596.00/CITY OF LONG BEACH FIRE DEPARTMEN

Work Order No: 08010117

Client ID: 4717

Date Sampled: 1/4/2008

Lab ID: 004A

DateReceived: 1/8/2008

Matrix: Quartz Filter

Air Vol.(L): 459.9

Analyte	Concentration (µg)	Concentration (mg/m³)	Reporting Limit (µg)	Test Method	Date Analyzed / Analyst	
Elemental Carbon	<2	<0.0043	2	NIOSH 5040	01/14/2008	CLH
Organic Carbon	28	0.061	2	NIOSH 5040	01/14/2008	CLH
Total Carbon	28	0.061	4	NIOSH 5040	01/14/2008	CLH

Client ID: 4716

Date Sampled: 1/4/2008

Lab ID: 005A

DateReceived: 1/8/2008

Matrix: Quartz Filter

Air Vol.(L): 433.4

Analyte	Concentration (µg)	Concentration (mg/m³)	Reporting Limit (µg)	Test Method	Date Analyzed / Analyst	
Elemental Carbon	<2	<0.0046	2	NIOSH 5040	01/14/2008	CLH
Organic Carbon	8.9	0.020	2	NIOSH 5040	01/14/2008	CLH
Total Carbon	8.9	0.020	4	NIOSH 5040	01/14/2008	CLH

Client ID: 4719-BLANK

Date Sampled: 1/4/2008

Lab ID: 006A

DateReceived: 1/8/2008

Matrix: Quartz Filter

Air Vol.(L): NA

Analyte	Concentration (µg)	Concentration (mg/m³)	Reporting Limit (µg)	Test Method	Date Analyzed / Analyst	
Elemental Carbon	<2	--	2	NIOSH 5040	01/14/2008	CLH
Organic Carbon	7.2	--	2	NIOSH 5040	01/14/2008	CLH
Total Carbon	7.2	--	4	NIOSH 5040	01/14/2008	CLH

## General Notes:

<: Less than the indicated reporting limit (RL).

--: Information not available or not applicable.



## **APPENDIX E**

### **CALIBRATION DOCUMENTATION**

Page 1 of 1  
Certificate Number: 43085  
Calibration Date: 20 December 2007



### Calibration Certificate

Asset No: **R4620**  
Description: **TSI 8551 Q-TRAK W/CO IAQ**  
Manufacturer: **TSI**  
Serial No: **51790**  
Calibration Date: **20 December 2007**  
Next Calibration: **Refer to Manufacturers Instructions**  
Accuracy of Unit Under Test: **Manufacturers Specifications**  
Adjustments made: **None**  
Calibration Technician: **Victor Vega**

Details of any limitations to the use of the equipment  
**None**

The following measurement equipment used during the calibration procedure is traceable to National Standards.

<u>Measurement Equipment/Standards</u>	<u>Reference</u>
1900 PPM CO2 - 103L-32	103L-32
CARBON MONOXIDE 50PPM, AIR BALANCE - 10125000	LOT912236
100% NITROGEN - 913568	913568
ZERO AIR - 913574	913574

Calibrated By:

A handwritten signature in black ink, appearing to read 'Victor Vega', is written over a horizontal line.

**Victor Vega**



TRUST. SCIENCE. INNOVATION.

# CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA Tel: 1-800-424-7427 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

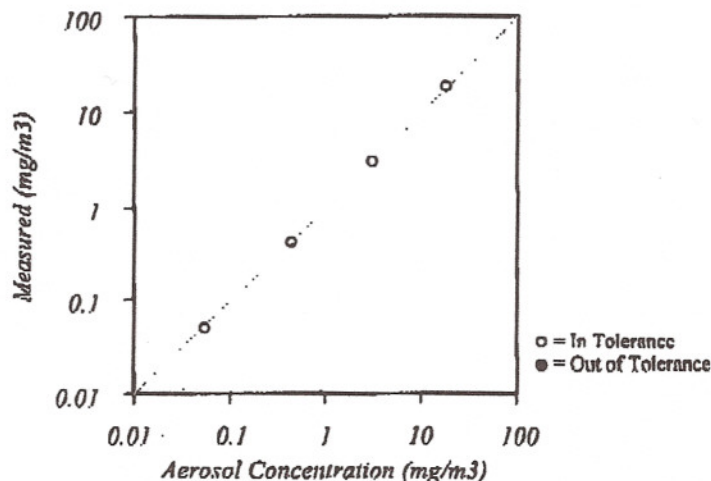
R6537

Environment Condition			Model	8520
Temperature	73.8 (23.2)	°F (°C)	Serial Number	85201796
Relative Humidity	50	%RH		
Barometric Pressure	28.74 (973.2)	inHg (hPa)		

☒ As Left  
☐ As Pound

☒ In Tolerance  
☐ Out of Tolerance

Linearity Plot



## Zero Stability Results

Average:	Minimum:	Maximum:	Time:
0.000 :mg/m³	0.000 :mg/m³	0.001 :mg/m³	4:00 :hrs.

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1. All test dust (Arizona dust). Our calibration ratio is greater than 1.2:1

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
DC Voltage	E002235	04-05-07	04-05-08	Barometric Pressure	E001329	04-30-07	04-30-08
Temperature	E002873	02-23-07	02-23-08	Humidity	E002873	02-23-07	02-23-08
DC Voltage	E003314	07-11-07	07-11-08	DC Voltage	E003315	07-11-07	07-11-08

*[Signature]*  
Calibrated

☒ Final Function Check

October 16, 2007

Date

*Hot Water Pipe Leak: Asbestos, Lead, and Microbiological Survey Findings*





**City of Long Beach  
Fire Station 9  
Hot Water Pipe Leak  
3917 Long Beach Boulevard, Long Beach, California  
Asbestos, Lead, and Microbiological Survey Findings**

**Pacific EH&S Report No. 15-1238A**

***Prepared for:***

**City of Long Beach  
Attention: Mr. Manuel Jaramillo**

***Prepared by:***

**Pacific EH&S Services, Inc.  
2192 Martin, Ste. 245  
Irvine, California 92612**

**April 30, 2015**



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## ATTACHMENTS

Table IA: Asbestos Survey Findings  
Table IIA: Lead Survey Findings  
Sample Locations Site Plan  
Survey Photos  
Laboratory Reports (Asbestos and Lead)

## **1.0 Introduction**

On April 27, 2015, Pacific EH&S Services, Inc.'s (Pacific EH&S) representative Robert Hudson, State of California Certified Site Surveillance Technician (CSST No. 01-3039) and California Department of Public Health (CDPH) Lead Inspector/Assessor (CDPH No. 11991), performed an asbestos, lead, and microbiological survey at the City of Long Beach's Fire Station 9 located at 3917 Long Beach Boulevard in Long Beach, California. This report has been prepared to present the survey findings.

## **2.0 Background Information**

This survey was performed at the request of Mr. Manuel Jaramillo of the City of Long Beach. Mr. Jaramillo informed Pacific EH&S that water had intruded into the substructure area of Fire Station 9 from a hot water pipe leak in an area beneath the Locker Room and Dorm Room. Plumbers had located the substructure pipe and performed a temporary repair. Wood floors were buckled in the Locker Room and Dorm.

Restoration work was likely needed in the affected area and Mr. Jaramillo requested that Pacific EH&S inspect the water impacted areas for evidence of mold growth and perform a survey to assess materials/surface coatings in that area for asbestos and lead content prior to the commencement of restoration work.

## **3.0 Scope of Services and Limitations**

### **3.1 Scope of Services**

Based on the available background information and at the request of Mr. Jaramillo, this survey included the following services:

- An inspection to determine whether mold was present on building materials, whether materials had elevated moisture content levels, and whether remediation was required to eliminate any identified mold contamination.
- A visual inspection of the specific areas of concern for the purpose of identifying materials or surface coatings suspected to contain asbestos and/or lead.
- The collection of representative bulk samples of observed suspect materials/surface coatings for the purpose of evaluating them for asbestos and/or lead content.
- Photo documentation of the surveyed materials/surface coatings and locations.
- The delivery of samples collected during the survey to qualified laboratories for appropriate analyses.

### **3.2 Limitations**

This survey was limited to the specific building areas of concern that had been identified by Mr. Jaramillo as having been impacted by the water intrusion at the time of the inspection. Our inspection and sampling efforts included intrusive techniques (i.e., pieces of existing material/surface coating were cut or chipped away at

representative locations and efforts were made to inspect areas under/behind the existing flooring). It should be noted, however, that not all areas were accessed for inspection/sampling, as extensive demolition would have been required to thoroughly inspect all such areas.

## **4.0 Visual Inspection Findings**

### **4.1 Identification of Suspected ACM**

Observed materials suspected to contain asbestos were grouped as homogenous materials (i.e., materials that were alike in color and texture and that were believed to have been installed at the same time), as outlined in Table IA provided as an attachment with this report.

### **4.2 Identification of Suspected Lead Containing Surface Coatings**

Observed surface coatings suspected to contain lead were grouped as functional groups (i.e., surface coatings that were alike in appearance and substrate and that were believed to have been installed at the same time), as outlined in Table IIA provided as an attachment with this report.

### **4.3 Identification of Materials and Surfaces Potentially Impacted by Microorganisms**

Wood flooring that was wet did not exhibit any visible mold growth. Visible mold was not noted at any other locations, though due to access restrictions, we were not able to inspect the entire substructure.

### **4.4 Photo Documentation**

Representative digital photographs were taken of the surveyed materials/surface coatings and locations and are provided as an attachment with this report. References to the photographs are presented in the attached tables.

## **5.0 Sampling and Analytical Techniques**

### **5.1 Asbestos Sampling and Analyses**

In order to assess the suspect materials observed during our survey for asbestos content, representative bulk material samples were collected for asbestos analyses. Wet methods were used during sample collection and each bulk specimen was sealed in an airtight container and assigned a discrete sample identification number. The sampling strategy utilized was based on applicable State of California, Department of Industrial Relations, Division of Occupational Safety and Health (Cal-OSHA) and United States Environmental Protection Agency (EPA) recommended sampling protocols. The specific sample locations are depicted on the Sample Locations Site Plan provided as an attachment with this report.

Following the field survey, the bulk samples were submitted for asbestos analysis to Forensic Analytical Laboratories, Inc. (Forensic) located in Rancho Dominguez, California, which was accredited by the National Institute of Standards and Technology through participation in the National Voluntary Laboratory Accreditation Program (NVLAP No. 101459-1). Sample analyses were performed by polarized light

microscopy (PLM) in accordance with the Interim Method for the Determination of Asbestos in Bulk Insulation Samples (EPA Method 600/R-93-116).

## **5.2 Lead Sampling and Analyses**

In order to assess the suspected lead containing surface coatings observed during our survey for lead content, representative bulk samples were collected for lead analyses. The samples were sealed in airtight containers and assigned discrete sample identification numbers. Generally speaking, our sampling strategy consisted of the collection of at least one representative sample from each functional group. The specific sample locations are depicted on the Sample Locations Site Plan provided as an attachment with this report.

Following our field survey, the samples were submitted for lead analyses to Forensic Analytical Laboratories, Inc. (Forensic) located in Rancho Dominguez, which was accredited by the American Industrial Hygiene Association (Laboratory ID No. 101629) and the State of California Department of Health Services Environmental Testing Laboratory (ELAP 1366). Analyses were performed by acid digestion and flame atomic absorption spectroscopy in accordance with EPA Method 3050B/7420.

## **6.0 Asbestos Sample Results and Conclusions**

### **6.1 Interpretation of Sample Results**

Upon consideration of the asbestos sample results, which are presented in Table IA and in the Forensic Analytical report provided as attachments with this report, it should be noted that an ACM, as defined by Cal-OSHA in Title 8, California Code of Regulations, Section 1529 (T8, CCR, §1529), is any material containing more than one percent asbestos. In addition, Cal-OSHA defines asbestos containing construction material as any material containing more than 0.1 percent asbestos.

The PLM analytical method used to analyze the samples collected during this survey had a lower limit of quantification of one percent. Given that detection limit, the following criteria were used to interpret the sample data: a material would be considered an ACM if asbestos was detected at any concentration (including at concentrations of less than one percent) in any samples within the group of samples that represented the material, and a material would be considered non-asbestos-containing if asbestos was not detected in any samples within the corresponding group.

### **6.2 Asbestos Findings**

None of the materials subjected to sampling were found to contain asbestos, and therefore they were all concluded to be non-ACMs.

## **7.0 Lead Sample Results and Conclusions**

### **7.1 Interpretation of Sample Results**

Upon consideration of the lead sample results, which are presented in Table IIA and in the laboratory report provided as attachments with this report, it should be noted that based on our sampling and analytical strategy, a surface coating type would be considered lead containing if lead was detected at a concentration at or above the laboratory's reported analytical detection limit in any of the samples representing the surface coating. Conversely, a surface coating type would be considered non-lead containing if lead was not detected at or above the laboratory's reported analytical detection limit in the corresponding sample(s).

### **7.2 Lead Findings**

Lead was not detected above the laboratory's analytical detection limit in the off-white paints on drywall and plaster walls in the water impacted areas.

## **8.0 Moisture and Surface Mold Sample Results and Conclusions**

### **8.1 Moisture Findings**

Firm mud was observed in the substructure in the general area of broken pipe and moisture testing revealed elevated levels of moisture in the wood flooring in much of the impacted area.

### **8.2 Surface Mold Findings**

Visible mold was not apparent on lower walls or on wood flooring in the impacted areas, therefore mold sampling was not deemed necessary.

## **9.0 Recommendations**

### **9.1 Work Involving Moisture Impacted / Damaged Materials**

Dry down activities should commence immediately within the substructure area in the region of the water intrusion. Care should be used in the set up of drying equipment so as to limit the pressurization of the substructure, which might force dust, debris, etc. up into the building.

### **9.2 Additional Asbestos, Lead, and Mold Considerations**

If, during future work, materials or surface coatings suspected to contain asbestos or lead are encountered that were not specifically addressed during this survey (e.g., under/behind existing materials or in areas of the building that were not included in this survey), the newly discovered suspect materials/surface coatings should be appropriately evaluated for asbestos and/or lead content prior to initiating any work or activities involving their disturbance.

City of Long Beach  
Fire Station 9  
Hot Water Pipe Leak  
3917 Long Beach Boulevard, Long Beach, California  
Asbestos, Lead, and Microbiological Survey Findings  
Pacific EH&S Report No. 15-1238A  
Page 5 of 5

If you have any comments or questions concerning the content of this report, or if we may be of further assistance, please contact our office at (949) 250-6396.

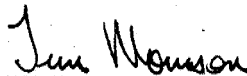
Sincerely,

**Pacific EH&S Services, Inc.**



---

Matthew W. Durlene  
Principal  
Certified Asbestos Consultant No. 96-2091



---

Timothy J. Morrison  
Certified Industrial Hygienist  
CADPH Lead Inspector/Assessor No. 4165



**Table IA**  
**Asbestos Survey Findings**  
**City of Long Beach, Fire Station 9**  
**3917 Long Beach Boulevard, Long Beach, California**  
**April 27, 2015**

Material Description	Material Location(s)	Quantity Estimate	Friability	Physical Damage	Sample No.(s)	Results	Photo No.(s)
Gray base cove and tan mastic	At base of walls in the Locker Room and Dorm	100 Lf	NF	2	15-1238-0427-A1 – A3	NAD	1
Tan mastic	Covering floors beneath rubber tiles in portions of the Locker Room and Dorm	800 ft <sup>2</sup>	NF	0	15-1238-0427-A4 – A6	NAD	2
Floor leveling compound	On floor threshold at Wash Room and Locker Room	5 ft <sup>2</sup>	NF	2	15-1238-0427-A7 – A9	NAD	3

**Legend**

- 0: No visible damage
- 1: Visible damage – <5% overall
- 2: Visible damage – 5-10% scattered or up to 25% localized
- 3: Visible damage – >10% scattered or >25% localized
- F: Friable
- ft<sup>2</sup>: Square feet
- Lf: Linear feet
- NAD: No asbestos detected
- NF: Non-friable

**Table IA**  
**Asbestos Survey Findings**  
**City of Long Beach, Fire Station 9**  
**3917 Long Beach Boulevard, Long Beach, California**  
**April 27, 2015**

Material Description	Material Location(s)	Quantity Estimate	Friability	Physical Damage	Sample No.(s)	Results	Photo No.(s)
Drywall and joint compound	Walls in portions of the Locker Room and Dorm	900 ft <sup>2</sup>	NF	0	15-1238-0427-A10 – A12	NAD	4
Plaster	Walls in portions of the Locker Room	200 ft <sup>2</sup>	NF	1	15-1238-0427-A13 – A15	NAD	5
Carpet with tan mastic	Covering floors beneath portions of the Dorm	400 ft <sup>2</sup>	NF	1	15-1238-0427-A16 – A18	NAD	6

**Legend**

0: No visible damage  
1: Visible damage – <5% overall  
2: Visible damage – 5-10% scattered or up to 25% localized  
3: Visible damage – >10% scattered or >25% localized  
F: Friable  
ft<sup>2</sup>: Square feet  
Lf: Linear feet  
NAD: No asbestos detected  
NF: Non-friable

Pacific EH&S Project No. 15-1238  
Page 2 of 2



**Table IIA**  
**Lead Survey Findings**  
**City of Long Beach, Fire Station 9**  
**3917 Long Beach Boulevard, Long Beach, California**  
**April 27, 2015**

Surface Coating Description	Surface Coating Location(s)	Sample No.(s)	Results (ppm)	Photo No.(s)
Off-white paint on drywall	Covering drywall in Dorm and portions of the Locker Room	15-1238-0427-P1	NLD	4
Off-white paint on plaster	Covering plaster in Locker Room	15-1238-0427-P2	NLD	5

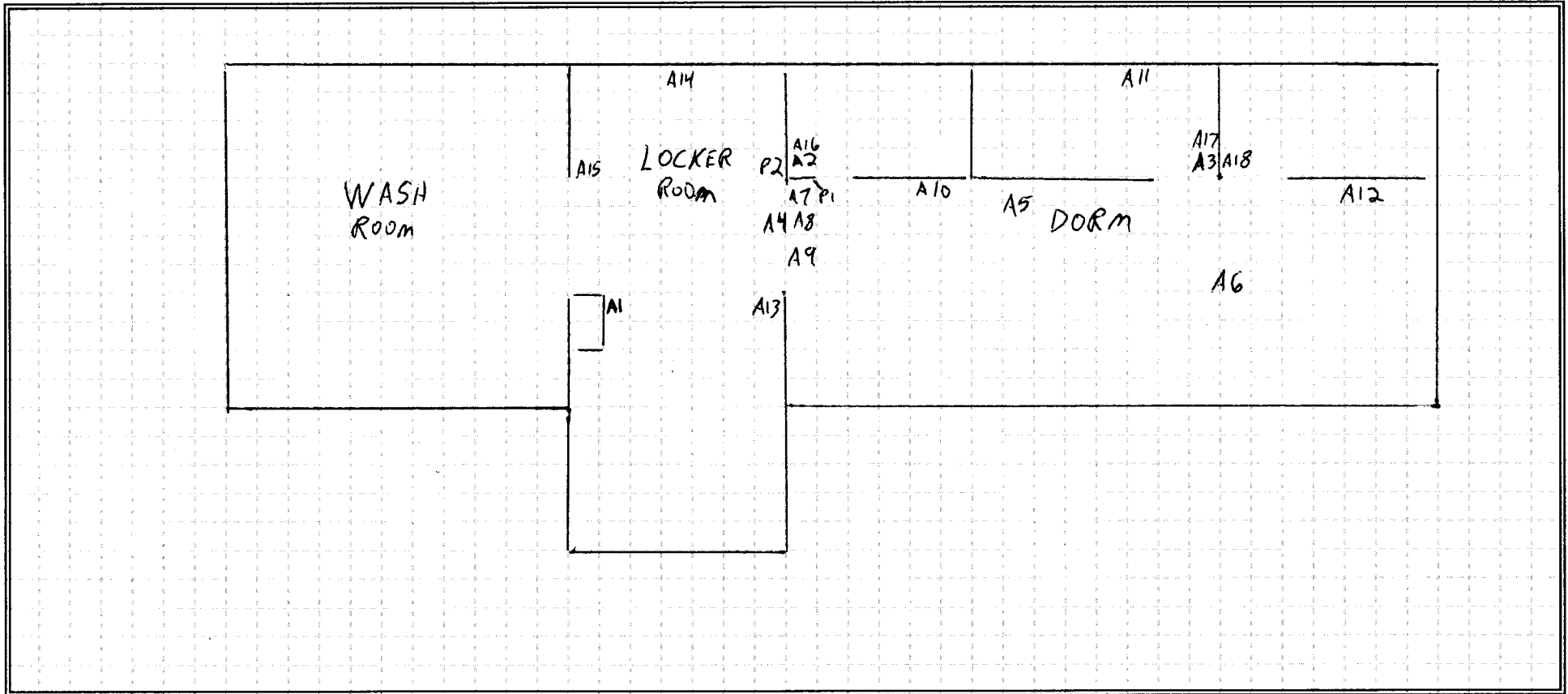
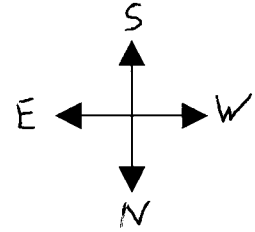
**Legend**

NLD: Not detected at concentration at or above the reported analytical detection limit  
ppm: Parts per million

Pacific EH&S Project No. 15-1238  
Page 1 of 1

# SAMPLE LOCATIONS SITE PLAN

Client: City of Long Beach  
Pacific EH&S Project No.: 15-1238  
Date: April 27, 2015  
Site: Fire Station 9  
3917 Long Beach Boulevard  
Long Beach, California



LEGEND:

NOTES:



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2.JPG



3.JPG

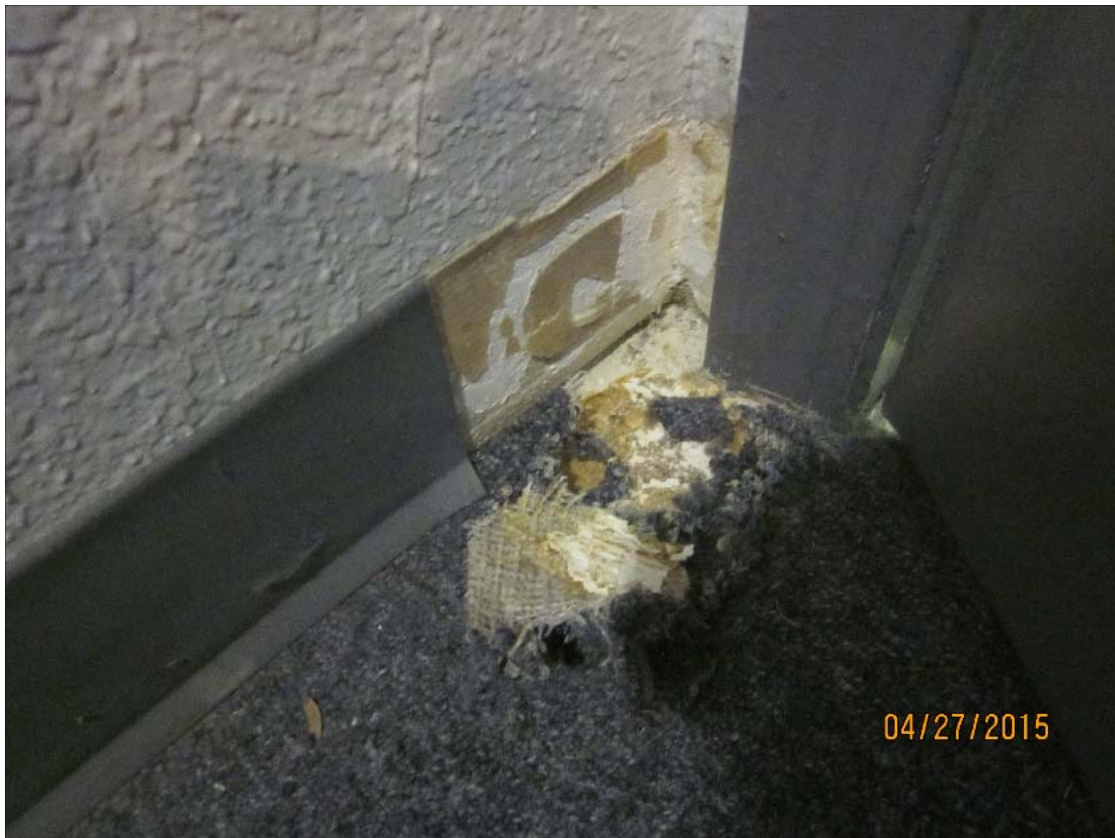


4.JPG





5.JPG



6.JPG



# Bulk Asbestos Analysis

(EPA Method 600/M4-82-020, Visual Area Estimation)\*

Pacific EH&S Services, Inc.  
Matt Durlene, Tim Morrison  
2192 Martin, Suite 245

Irvine, CA 92612

**Client ID:** 6030  
**Report Number:** B204765  
**Date Received:** 04/27/15  
**Date Analyzed:** 04/28/15  
**Date Printed:** 04/28/15  
**First Reported:** 04/28/15

**Job ID/Site:** 15-1238

**Date(s) Collected:** 04/27/2015

**FALI Job ID:** 6030  
**Total Samples Submitted:** 18  
**Total Samples Analyzed:** 18

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
<b>15-1238-0427-A1</b>	50928384						
Layer: Grey Non-Fibrous Material			ND				
Layer: Off-White Mastic			ND				
Layer: Paint			ND				
Layer: White Skimcoat/Joint Compound			ND				
Layer: Beige Plaster			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND)							
<b>15-1238-0427-A2</b>	50928385						
Layer: Grey Non-Fibrous Material			ND				
Layer: Off-White Mastic			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND)							
<b>15-1238-0427-A3</b>	50928386						
Layer: Grey Non-Fibrous Material			ND				
Layer: Off-White Mastic			ND				
Layer: White Skimcoat/Joint Compound			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND)							
<b>15-1238-0427-A4</b>	50928387						
Layer: Tan Mastic with Debris			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (ND) Fibrous Glass (ND)							
<b>15-1238-0427-A5</b>	50928388						
Layer: Tan Mastic with Debris			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (ND) Fibrous Glass (ND)							
<b>15-1238-0427-A6</b>	50928389						
Layer: Tan Mastic with Debris			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (ND) Fibrous Glass (ND)							

**Client Name:** Pacific EH&S Services, Inc.

**Report Number:** B204765

**Date Printed:** 04/28/15

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
<b>15-1238-0427-A7</b>	50928390						
Layer: Yellow Mastic			ND				
Layer: White Non-Fibrous Material			ND				
Layer: Tan Mastic			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND)							
<b>15-1238-0427-A8</b>	50928391						
Layer: Yellow Mastic			ND				
Layer: White Non-Fibrous Material			ND				
Layer: Tan Mastic			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND)							
<b>15-1238-0427-A9</b>	50928392						
Layer: Yellow Mastic			ND				
Layer: White Non-Fibrous Material			ND				
Layer: Tan Mastic			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND)							
<b>15-1238-0427-A10</b>	50928393						
Layer: White Skimcoat/Joint Compound			ND				
Layer: Paint			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND)							
<b>15-1238-0427-A11</b>	50928394						
Layer: White Skimcoat/Joint Compound			ND				
Layer: Paint			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND)							
<b>15-1238-0427-A12</b>	50928395						
Layer: White Skimcoat/Joint Compound			ND				
Layer: Paint			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND)							
<b>15-1238-0427-A13</b>	50928396						
Layer: Beige Plaster			ND				
Layer: White Plaster			ND				
Layer: Paint			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND)							

**Client Name:** Pacific EH&S Services, Inc.

**Report Number:** B204765

**Date Printed:** 04/28/15

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
<b>15-1238-0427-A14</b>	50928397						
Layer: Beige Plaster			ND				
Layer: White Plaster			ND				
Layer: Paint			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND)							
<b>15-1238-0427-A15</b>	50928398						
Layer: Beige Plaster			ND				
Layer: White Plaster			ND				
Layer: Paint			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND)							
<b>15-1238-0427-A16</b>	50928399						
Layer: Grey Carpet			ND				
Layer: Tan Mastic			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND) Synthetic (85 %)							
<b>15-1238-0427-A17</b>	50928400						
Layer: Grey Carpet			ND				
Layer: Tan Mastic			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND) Synthetic (85 %)							
<b>15-1238-0427-A18</b>	50928401						
Layer: Grey Carpet			ND				
Layer: Tan Mastic			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace) Fibrous Glass (ND) Synthetic (85 %)							



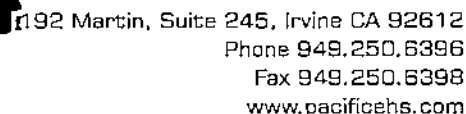
Tiffani Ludd, Laboratory Supervisor, Rancho Dominguez Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

Analytical results and reports are generated by Forensic Analytical Laboratories Inc. (FALI) at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by FALI to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by FALI. The client is solely responsible for the use and interpretation of test results and reports requested from FALI. Forensic Analytical Laboratories Inc. is not able to assess the degree of hazard resulting from materials analyzed. FALI reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. All samples were received in acceptable condition unless otherwise noted.

\* Note: This report also contains asbestos content by layer per the recommended EPA method 600/R-93-116





CHAIN OF CUSTODY	PRINT NAME	SIGNATURE	DATE & TIME
RELINQUISHED BY	ROBERT HUOSON	<i>Robert Huoson</i>	11:20 4/27/15
RECEIVED BY	JOAN CARILLO DA	<i>Joan Carillo</i>	4-27-15 11:01A
RELINQUISHED BY			
RECEIVED BY			
RELINQUISHED BY			
RECEIVED BY			



# Metals Analysis of Paints

Pacific EH&S Services, Inc.  
Matt Durlene, Tim Morriso  
2192 Martin, Suite 245

Irvine, CA 92612

**Client ID:** 6030  
**Report Number:** M160436  
**Date Received:** 04/27/15  
**Date Analyzed:** 04/28/15  
**Date Printed:** 04/28/15  
**First Reported:** 04/28/15

**Job ID / Site:** 15-1238  
**Date(s) Collected:** 04/27/15

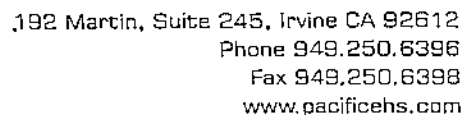
**FALI Job ID:** 6030  
**Total Samples Submitted:** 2  
**Total Samples Analyzed:** 2

Sample Number	Lab Number	Analyte	Result	Result Units	Reporting Limit*	Method Reference
15-1238-0427-P1	LM113099	Pb	< 0.006	wt%	0.006	EPA 3050B/7420
15-1238-0427-P2	LM113100	Pb	< 0.006	wt%	0.006	EPA 3050B/7420

\* The Reporting Limit represents the lowest amount of analyte that the laboratory can confidently detect in the sample, and is not a regulatory level. The Units for the Reporting Limit are the same as the Units for the Final Results.

Seyla Te, Laboratory Supervisor, Rancho Dominguez Laboratory

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CHAIN OF CUSTODY	PRINT NAME	SIGNATURE	DATE & TIME
RELINQUISHED BY	ROBERT HUDSON	<i>Robert Hudson</i>	11:20 - 4/27/15
RECEIVED BY	JO ANN CARRILLO DA	<i>Jo Ann Carrillo</i>	4-27-15 11:01 AM
RELINQUISHED BY			
RECEIVED BY			
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## *Indoor Air Quality Investigation*



Fire Station No. 9  
3917 Long Beach Boulevard  
Long Beach, California  
Indoor Air Quality Investigation Findings

**Pacific EH&S Report No. 17-1463A Rev.1**

***Prepared for:***

**City of Long Beach  
Attention: Kevin Burke**

***Prepared by:***

**Pacific EH&S Services, Inc.  
2192 Martin, Ste. 245  
Irvine, California 92612**

**September 5, 2017**

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- Survey Photographs
- Laboratory Report

## EXECUTIVE SUMMARY

### Investigation Scope and Objectives

On July 28, 2017, Pacific EH&S Services, Inc. performed an indoor air quality investigation at Fire Station 9 located at 3917 Long Beach Boulevard, Long Beach California. This investigation was initiated in response to concerns by occupants of the building about the air quality in the building, specifically in several sleeping quarters.

### Findings and Conclusions

- With regards to the various tested surfaces within Fire Station No. 9, the surface dust samples were found to have distributions consisting primarily of unidentified opaque particles, soil/mineral dusts, skin cells, cellulosic/fabric fibers, mold spores, and pollen; with all showing normal levels. No evidence of insect infestations, mites, mold growth, or other unusual particulate types were noted in the dust samples. If further analysis to ascertain the exact nature of the opaque particles is required, additional analyses by scanning electron microscopy can be performed.
- Non-cultured spore trap and particulate characterization air samples were collected in Fire Station No. 9, with the mold spore results revealing low levels of normally occurring environmental molds in the sampled areas. The airborne concentrations and distributions were considered completely normal and indicative of a normal indoor environment.
- We also identified opaque particles, soil and mineral particles, and cellulose and fabric fibers in the air samples, suggesting that by and large, the particles in the air mirrored the particles that were found on surfaces.
- These results indicated that the workplace was absent of elevated concentrations of contaminants that would likely be implicated in indoor air quality complaints. These results indicated that the individuals and their activities were the primary sources of the dust constituents in the area.

## 1.0 Introduction and Background Information

On July 28, 2017, Pacific EH&S Services, Inc. performed an indoor air quality investigation at Fire Station No. 9 located at 3917 Long Beach Boulevard in Long Beach California. This investigation was initiated in response to concerns by occupants of the building about the air quality in the building, specifically in several sleeping quarters.

Based on the background information provided and the request of the City of Long Beach, this investigation was intended to generate information regarding potential causes of indoor air quality concerns, as well as to provide insight into additional preventative measures needed, if any, to minimize or prevent future problems.

## 2.0 Scope of Services

### 2.1 Scope of Services

Based on the available background information and the request of Mr. Kevin Burke, this survey included the following services:

- A visual inspection of two sleeping/bedroom areas, the hallway outside of the subject bedrooms, and the kitchen area, for the purpose of identifying any conditions that might have contributed to the indoor air quality concerns.
- The collection of representative surface and air samples for the purpose of evaluating for mold, fungi, and individual dust constituents.
- Visual analysis for moisture staining and or damage of pertinent building materials for the purpose of identifying any potential water intrusion sources or other likely causes of the poor air quality concerns.
- The delivery of samples collected during the survey to a qualified laboratory for appropriate analyses.

## 3.0 Visual Inspection Findings

Building materials at Fire Station No. 9 included gypsum walls, a dropped ceiling system with suspended ceiling tiles, and carpeting throughout.

The inspected areas of concern included the two residential bedroom areas, the hallway just outside of the bedrooms, and the kitchen. All building materials and furnishings in these areas appeared to be in good condition, with no visible water staining, damage, wear, or deterioration observed.

Our visual inspection noted minor to light accumulations of dust on most horizontal surfaces in the inspected areas, and light to moderate particulate matter build-up on supply and return air registers, including on the surrounding ceiling tiles. Two of the beds in the areas sampled appeared small black dots on the mattresses, resembling small Sharpie® pen marks, but the precise identify of which could not be visually determined.



## 4.0 Sampling and Analytical Techniques

### 4.1 Moisture Inspection of Building Materials

Building materials throughout the inspected portions of Fire Station No. 9 were visually evaluated for moisture staining and damage, with no evidence of such damage noted.

### 4.2 Surface Dust Characterization Sampling

Samples of dust and particulate matter were collected from the surfaces of window sills, blinds, beds, and bedding in the portions of Fire Station No. 9 included in our scope of work. The sampling and analytical strategy consisted of the collection of representative surface samples for mold and particulate analysis using Biotape® media, and subsequently analyzed under bright field or phased contrast illumination for the characterization of particulate matter present. .

The resultant data are summarized in the “Sample Results and Conclusions” section below, and appear in the laboratory report provided as an attachment with this report.

### 4.3 Airborne Mold Spore and Particulate Characterization Sampling

Air samples for the characterization of mold spores, dust and particulate matter were collected in several areas in Fire Station No. 9, as well as at representative outdoor control locations. The air samples were collected on pre-treated microscope slides using Burkard Volumetric Personal Air Samplers. The microscope slides were subsequently viewed under bright field or phased contrast illumination for the quantification and identification of fungal genera present, as well as for the characterization of airborne dust and particulate matter. The particulate matter was identified based on their morphological, physical, and optical properties with the aid of a polarizing microscope, where necessary. The resultant data are summarized in the “Sample Results and Conclusions” section below, and appear in the laboratory report provided as an attachment with this report.

## 5.0 Sample Results and Conclusions

### 5.1 Surface Dust Characterization Results

Our experience and research indicate that several components of dust are routinely found in the indoor environment. Skin flakes, cellulose fibers, gypsum (from chalk or drywall), and synthetic and plastic fibers are found in virtually all indoor environments. Human and animal hair, pollen, fungal spores, fibrous glass, wood fragments, and plant materials are also generally found. Occasionally, other materials such as soot, bird feathers, insect parts, mineral grains from soil, and particulate (from spray paint or copier toner) are found.

The importance of these dust components is not fully understood at this time, but it is generally believed that exposures to low levels of such materials does not produce ill effects in most persons. However, a portion of the typical dusts, such as fungal spores and pollen may cause allergic responses in sensitive individuals. Certain components such as fibrous glass are under very close scrutiny by the health community, with research focusing on irritant and long-term health effects. Trace levels of synthetic man-made fibers

(including fiberglass) are routinely found on interior building surfaces in buildings with fiberglass insulation, and therefore, the presence of trace levels of fiberglass on surfaces in a building is not considered unusual. Other components, such as cellulose, plant materials, wood fragments, etc., may be nutrient sources for microorganism growth.

With regards to the various tested surfaces within Fire Station No. 9, the surface dust samples were found to have distributions consisting primarily of unidentified opaque particles, soil/mineral dusts, skin cells, cellulosic/fabric fibers, mold spores, and pollen; with all showing normal levels. No evidence of insect infestations, mites, mold growth, or other unusual particulate types were noted in the dust samples. If further analysis to ascertain the exact nature of the opaque particles is required, additional analyses by scanning electron microscopy can be performed.

Nothing unusual was identified in the sample from the mattress, suggesting that the black dots were not of biological origin or anything that could be lifted/removed from the mattress surface.

## **5.2 Airborne Mold Spore and Particulate Characterization Results**

Non-cultured spore trap and particulate characterization air samples were collected in Fire Station No. 9, with the mold spore results revealing low levels of normally occurring environmental molds in the sampled areas. The airborne concentrations and distributions were considered completely normal and indicative of a normal indoor environment.

The laboratory also identified opaque particles, soil and mineral particles, and cellulose and fabric fibers in the air samples, suggesting that by and large, the particles in the air mirrored the particles that were found on surfaces.

These results indicated that the workplace was absent of elevated concentrations of contaminants that would likely be implicated in indoor air quality complaints. These results indicated that the individuals and their activities were the primary sources of the dust constituents in the area.

## **5.3 Final Conclusions**

- Collectively, the data generated during this survey indicated that the sampled areas had accumulations of dust largely attributable to the activities occurring in and the persons occupying the subject areas, with contributions also coming from outdoor infiltration of air. These results collectively suggested that interior cleaning of the building may be lacking to a minor degree.
- The results of the surface sampling revealed that no unusual contaminants were present. Of the constituents that were present, unidentified opaque fibers, soil/mineral dust were most abundant, followed by various concentrations of skin cells, cellulose particles, and other common items. These results indicated that the workplace was absent of contaminants that would likely be implicated in indoor air quality complaints.
- No odors, water stains or damage, mold growth, and/or any other likely cause of poor air quality were noted at the time of inspection in the sampled areas.

- It is important to note that the results discussed herein should not be used to imply that an unhealthy environment exists or that any type of exposure guideline or standard was approached or exceeded, as that was not the case. In fact, the data generated during this survey did not yield findings of contaminants (dusts, fibers, mold spores, etc.) at concentrations that we believe would pose increased exposure potentials, or cause any measurable health risks to occupants of the building.

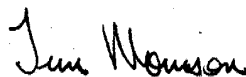
## 6.0 Recommendations

- Although not believed mandatory, the subject area could be subjected to more frequent and thorough cleaning so as to minimize the quantity of soil/mineral dust and other common particle build-ups in the area.
- No additional sampling or testing is deemed necessary at this point, as more sampling is not expected to provide additional relevant data.

If you have any comments or questions concerning the content of this report, or if we may be of further assistance, please contact our office at (949) 250-6396.

Sincerely,

Pacific EH&S Services, Inc.



---

Timothy J. Morrison  
Certified Industrial Hygienist



June, 28, 2017

City of LB  
Indoor Air Quality Investigation Findings  
3917 Long Beach Boulevard  
Long Beach, California

Project EH&S No. 17-1463



Bedroom 1 Air Sample.jpg



Bedroom 1 bedding T2 sample.jpg

June, 28, 2017

City of LB  
Indoor Air Quality Investigation Findings  
3917 Long Beach Boulevard  
Long Beach, California

Project EH&S No. 17-1463



Bedroom 1 Bio Tape Window Sill.jpg



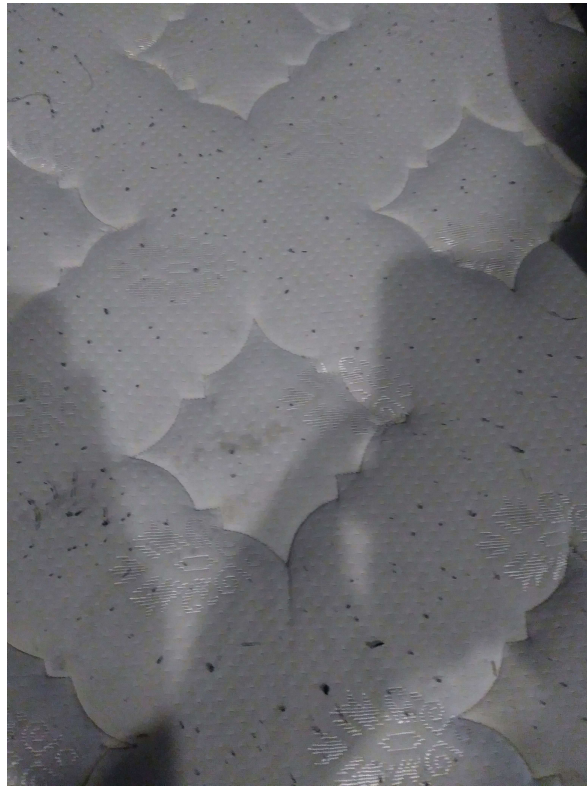
Bedroom 2 Air Sample.jpg



June, 28, 2017

City of LB  
Indoor Air Quality Investigation Findings  
3917 Long Beach Boulevard  
Long Beach, California

Project EH&S No. 17-1463



Bedroom 2 bedding T4 sample.jpg



Bedroom 2 BioTape T4 sample.jpg

June, 28, 2017

City of LB  
Indoor Air Quality Investigation Findings  
3917 Long Beach Boulevard  
Long Beach, California

Project EH&S No. 17-1463



Bedroom 2 Window Sill Sample.jpg



Hallway between living quarters.jpg

June, 28, 2017

City of LB  
Indoor Air Quality Investigation Findings  
3917 Long Beach Boulevard  
Long Beach, California

Project EH&S No. 17-1463



Kitchen Air Sample.jpg



Outdoor Control.jpg



**AIRBORNE MOLD AND DUST ANALYSIS**

EAA Method #: DUST-A01

Data Page 1 of 2

Client Name : Pacific EH&amp;S Services, Inc.

Client Project #: 17-1463

Project description : 17-1463

Requested by : G. Burchell

Date collected : 7/28/17

EAA Project#: 17-0248

Sample received : 7/31/17

Sample condition : Acceptable as received

Client Sample#	Sample Description / Location	General Comments				
17-1463-0728-B1	Kitchen; North end of building	Moderate dust.				
17-1463-0728-B2	Bedroom 1: "BOE2"	High dust. Biogenic dust predominant opaque particle.				
17-1463-0728-B3	Bedroom 2; "3"	High dust. Biogenic dust predom. opaque particle. Stachy detected				
17-1463-0728-B4	Hallway outside bedrooms; AC unit	High dust. Biogenic dust predominant opaque particle.				
17-1463-0728-B5	Outdoor control; front entrance	High dust.				
AIRBORNE MOLD SPORE CONCENTRATIONS (Cts./m <sup>3</sup> ) -- Spore Trap Sample Analysis <span style="float:right">High mag. used 600X</span>						
Category	Sample # -->	17-1463-0728-B1	17-1463-0728-B2	17-1463-0728-B3	17-1463-0728-B4	17-1463-0728-B5
Total Mold Spores (Cts/m <sup>3</sup> )		not detected	299	71	342	1700
Alternaria				28		
Aspergillus/Penicillium						771
Ascospores						
Basidiospores						193
Botrytis						
Chaetomium			14			14
Cladosporium			257		257	707
Curvularia						
Drechslera/Bipolaris					14	
Epicoccum					14	
Fusarium						
Nigrospora						
Oidium/Peronospora						
Pithomyces						
Rusts						
Smuts / Myxomycetes / Periconia			28	14		
Stachybotrys				14		
Stemphylium						
Torula						
Ulocladium				14		
Other Hyaline Fungi					57	
Unidentified Brown Fungi						14
Unidentified Fungi						
Hyphae fragments			42	14	14	14
Algal / fern spores						
Insect parts					14	
POLLEN (Total cts/m <sup>3</sup> )		not detected	14	14	14	29
Not specified			14	14	14	29
Pinus						
COMMON AEROSOLS (cts/m3)						
Skin cell fragments		2620	19900	2250	2960	643
Fiberglass fibers					28	
Cellulosic / fabric fibers		107	509	42	127	42
Unidentified opaque		6610	39500	21900	43200	19000
Soil / mineral dust		13500	51400	23800	32100	15400
OTHER AEROSOLS (cts/m3)		not detected	not detected	not detected	not detected	not detected
Statistical Parameters						
Vol. analyzed (m <sup>3</sup> )-high mag - 600x:		0.016	0.016	0.016	0.016	0.016
Detect limit(Cts/m <sup>3</sup> )-high magnification:		62.3	64.3	64.3	64.3	64.3
% sample analyzed-high magnification:		23%	22%	22%	22%	22%
Vol. analyzed(m <sup>3</sup> )/entire sple 150-300x:		0.070	0.070	0.070	0.070	0.070
* Detection limit (Cts/m <sup>3</sup> )/entire sple:		14.3	14.3	14.3	14.3	14.3
* Note: The "entire sample" detection limit applies to the "large" particle categories analyzed during the low magnification examination of the entire sample						
Sample flow rate (lpm):		14.0	14.0	14.0	14.0	14.0
Sample trace length (mm):		14.40	14.40	14.40	14.40	14.40
Microscope field diameter (mm):		0.330	0.320	0.320	0.320	0.320

Note: Sample results are only applicable to the items or locations tested

doc.rev.2 -8/10/16

Raw/extrapolated count data are given on a separate page.

Authorized / data reviewed by :

*Daniel M. Baxter*

Report date: 8/13/17

**AIRBORNE MOLD AND DUST ANALYSIS**

Client Name : Pacific EH&amp;S Services, Inc.

Graphical page 1 of 1

Client Project # : 17-1463

Project : 17-1463

EAA Project# : 17-0248

Date Collected : 07/28/17

Sample # : **17-1463-0728-B1**Description : **Kitchen; North end of building**

The following interpretation guidelines are based on the average mold spore and aerosol concentration ranges historically measured in indoor office, commercial, and "clean" residential environments. Residential environments experience higher variation and concentrations of certain bioaerosols. The ranges are based on publications by EAA, and 25 years experience providing analysis throughout the country from "clean" and "contaminated" residential and commercial buildings. An explanation for the interpretation of data is given in the accompanying information sheet.



As/Pe = Aspergillus/Penicillium, W.I. = Water indicating fungi (Stachybotrys, Chaetomium, Ulocladium), As/Ba = Asco/Basidiospores, Clad = Cladosporium, Oth = Other

**GENERAL AIRBORNE MOLD SPORE INTERPRETATION GUIDELINES**

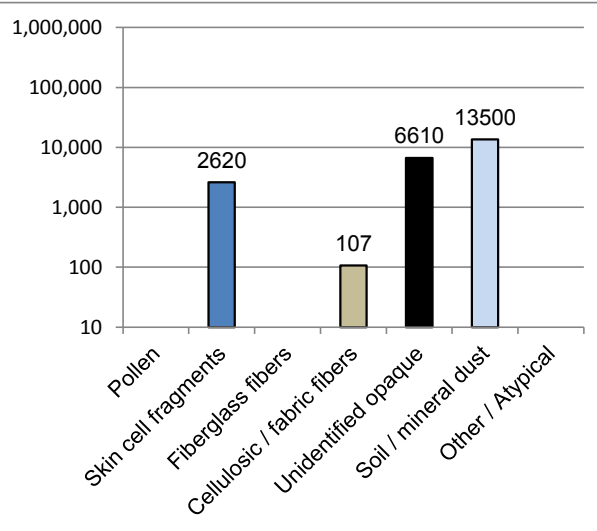
Mold Spore Category	Concen. Range	Distribution Type
Total Spores	Not detected	Not applicable
Aspergillus/Penicillium	Not detected	Normal / typical
Chronic Water Indicating Fungi	Not detected	Not detected
Typical Outdoor Fungi	Not detected	Not detected

*\*\*"Source" refers to the possible presence of a local mold growth source*

All concentrations in particle counts per cubic meter of air (cts/m<sup>3</sup>)

**OTHER AEROSOLS INTERPRETATION GUIDELINES**

Particle Category	Concen. range
Pollen	Not detected
Skin cell fragments	Normal / typical
Fiberglass fibers	Not detected
Cellulosic / fabric fibers	Normal / typical
Unidentified opaque	Moderate
Soil / mineral dust	Low - moderate
Other / Atypical	Not detected



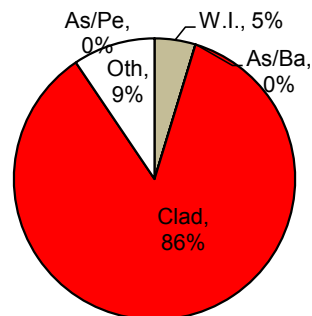
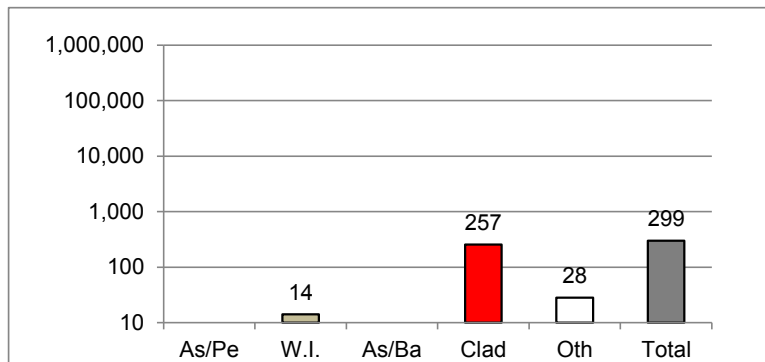
**Specific Comments : Moderate dust.**

Photos not requested

**AIRBORNE MOLD AND DUST ANALYSIS****Client Name :** Pacific EH&S Services, Inc.**Client Project # :** 17-1463**EAA Project# :** 17-0248**Sample # :** 17-1463-0728-B2**Project :** 17-1463**Date Collected :** 07/28/17**Description :** Bedroom 1: "BOE2"

Graphical page 1 of 2

The following interpretation guidelines are based on the average mold spore and aerosol concentration ranges historically measured in indoor office, commercial, and "clean" residential environments. Residential environments experience higher variation and concentrations of certain bioaerosols. The ranges are based on publications by EAA, and 25 years experience providing analysis throughout the country from "clean" and "contaminated" residential and commercial buildings. An explanation for the interpretation of data is given in the accompanying information sheet.



As/Pe = Aspergillus/Penicillium, W.I. = Water indicating fungi (Stachybotrys, Chaetomium, Ulocladium), As/Ba = Asco/Basidiospores, Clad = Cladosporium, Oth = Other

**GENERAL AIRBORNE MOLD SPORE INTERPRETATION GUIDELINES**

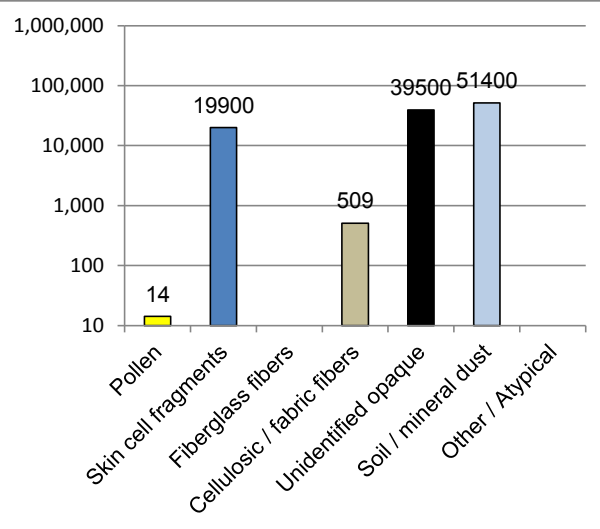
Mold Spore Category	Concen. Range	Distribution Type
Total Spores	Low	Not applicable
Aspergillus/Penicillium	Not detected	Normal / typical
Chronic Water Indicating Fungi	Detected - Low	Detected / background
Typical Outdoor Fungi	Typical - low	Outdoor distribution

\*\*"Source" refers to the possible presence of a local mold growth source

All concentrations in particle counts per cubic meter of air (cts/m<sup>3</sup>)

**OTHER AEROSOLS INTERPRETATION GUIDELINES**

Particle Category	Concen. range
Pollen	Detected
Skin cell fragments	Moderate
Fiberglass fibers	Not detected
Cellulosic / fabric fibers	Low - moderate
Unidentified opaque	High
Soil / mineral dust	Moderate
Other / Atypical	Not detected



**Specific Comments :** High dust. Biogenic dust predominant opaque particle.

Photos not requested

**AIRBORNE MOLD AND DUST ANALYSIS**

Client Name : Pacific EH&amp;S Services, Inc.

Client Project # : 17-1463

EAA Project# : 17-0248

Sample # : **17-1463-0728-B3**

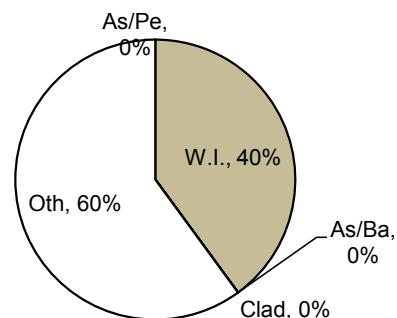
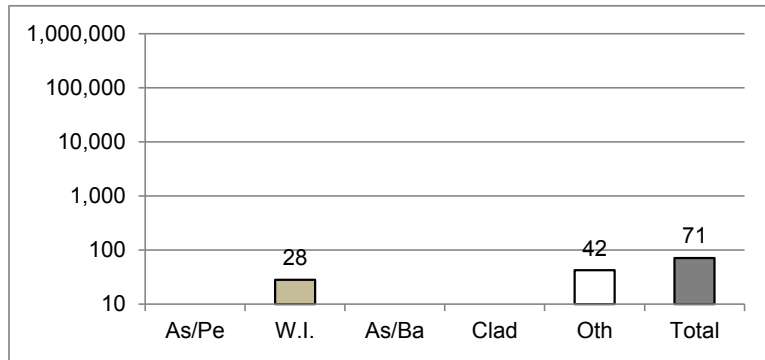
Project : 17-1463

Date Collected : 07/28/17

Description : **Bedroom 2; "3"**

Graphical page 1 of 3

The following interpretation guidelines are based on the average mold spore and aerosol concentration ranges historically measured in indoor office, commercial, and "clean" residential environments. Residential environments experience higher variation and concentrations of certain bioaerosols. The ranges are based on publications by EAA, and 25 years experience providing analysis throughout the country from "clean" and "contaminated" residential and commercial buildings. An explanation for the interpretation of data is given in the accompanying information sheet.



As/Pe = Aspergillus/Penicillium, W.I. = Water indicating fungi (Stachybotrys, Chaetomium, Ulocladium), As/Ba = Asco/Basidiospores, Clad = Cladosporium, Oth = Other

**GENERAL AIRBORNE MOLD SPORE INTERPRETATION GUIDELINES**

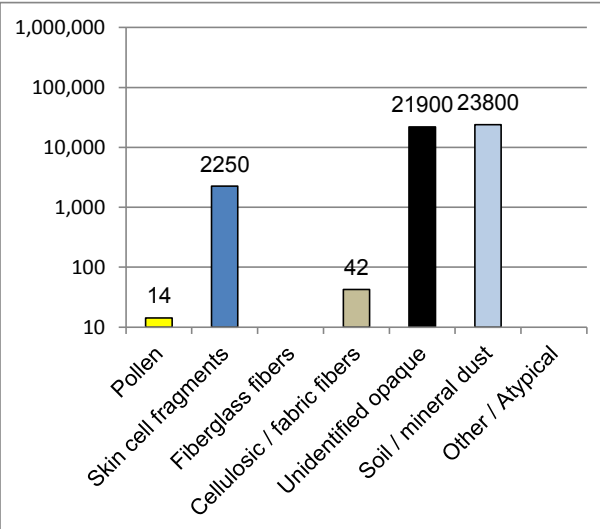
Mold Spore Category	Concen. Range	Distribution Type
Total Spores	Low	Not applicable
Aspergillus/Penicillium	Not detected	Normal / typical
Chronic Water Indicating Fungi	Detected - Low	Detected / background
Typical Outdoor Fungi	Low	Moderate infiltration

\*\*"Source" refers to the possible presence of a local mold growth source

All concentrations in particle counts per cubic meter of air (cts/m³)

**OTHER AEROSOLS INTERPRETATION GUIDELINES**

Particle Category	Concen. range
Pollen	Detected
Skin cell fragments	Normal / typical
Fiberglass fibers	Not detected
Cellulosic / fabric fibers	Very low
Unidentified opaque	High
Soil / mineral dust	Moderate
Other / Atypical	Not detected



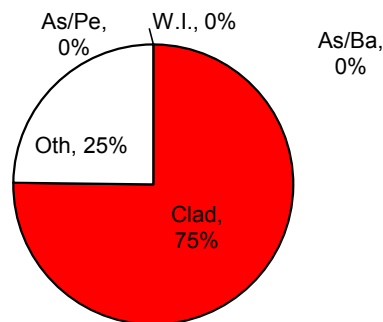
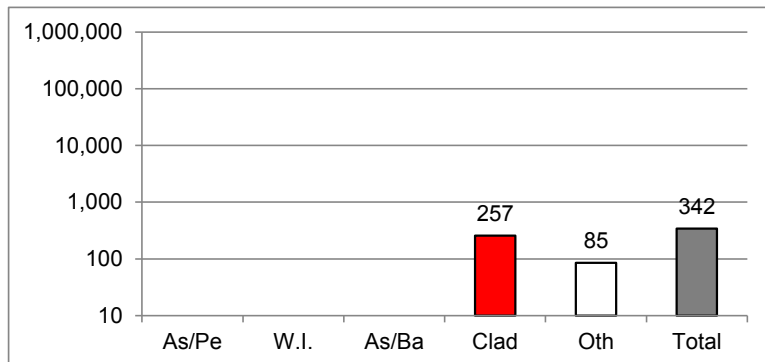
**Specific Comments :** High dust. Biogenic dust predom. opaque particle. Stachy detected

Photos not requested

**AIRBORNE MOLD AND DUST ANALYSIS****Client Name :** Pacific EH&S Services, Inc.**Client Project # :** 17-1463**EAA Project# :** 17-0248**Sample # :** 17-1463-0728-B4**Project :** 17-1463**Date Collected :** 07/28/17**Description :** Hallway outside bedrooms; AC unit

Graphical page 1 of 4

The following interpretation guidelines are based on the average mold spore and aerosol concentration ranges historically measured in indoor office, commercial, and "clean" residential environments. Residential environments experience higher variation and concentrations of certain bioaerosols. The ranges are based on publications by EAA, and 25 years experience providing analysis throughout the country from "clean" and "contaminated" residential and commercial buildings. An explanation for the interpretation of data is given in the accompanying information sheet.



As/Pe = Aspergillus/Penicillium, W.I. = Water indicating fungi (Stachybotrys, Chaetomium, Ulocladium), As/Ba = Asco/Basidiomycetes, Clad = Cladosporium, Oth = Other

**GENERAL AIRBORNE MOLD SPORE INTERPRETATION GUIDELINES**

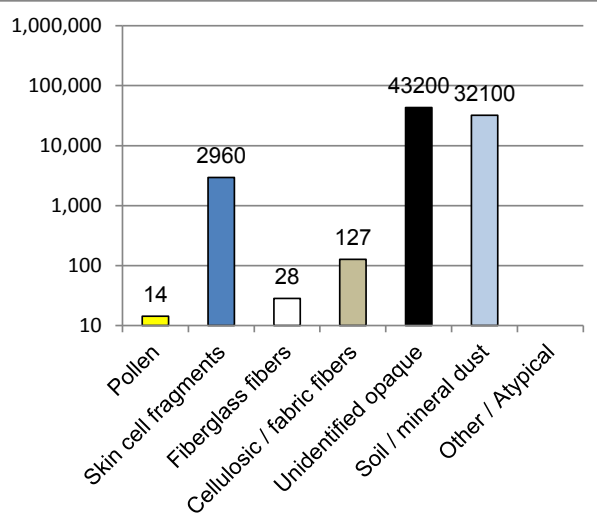
Mold Spore Category	Concen. Range	Distribution Type
Total Spores	Low	Not applicable
Aspergillus/Penicillium	Not detected	Normal / typical
Chronic Water Indicating Fungi	Not detected	Not detected
Typical Outdoor Fungi	Typical - low	Outdoor distribution

*\*\*"Source" refers to the possible presence of a local mold growth source*

All concentrations in particle counts per cubic meter of air (cts/m<sup>3</sup>)

**OTHER AEROSOLS INTERPRETATION GUIDELINES**

Particle Category	Concen. range
Pollen	Detected
Skin cell fragments	Normal / typical
Fiberglass fibers	Low - moderate
Cellulosic / fabric fibers	Normal / typical
Unidentified opaque	High
Soil / mineral dust	Moderate
Other / Atypical	Not detected



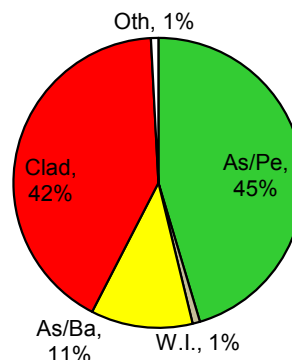
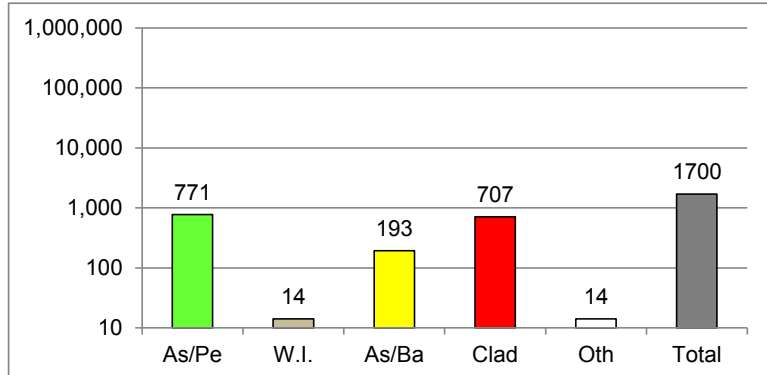
**Specific Comments :** High dust. Biogenic dust predominant opaque particle.

Photos not requested

**AIRBORNE MOLD AND DUST ANALYSIS****Client Name :** Pacific EH&S Services, Inc.**Client Project # :** 17-1463**EAA Project# :** 17-0248**Sample # :** 17-1463-0728-B5**Project :** 17-1463**Date Collected :** 07/28/17**Description :** Outdoor control; front entrance

Graphical page 1 of 5

The following interpretation guidelines are based on the average mold spore and aerosol concentration ranges historically measured in indoor office, commercial, and "clean" residential environments. Residential environments experience higher variation and concentrations of certain bioaerosols. The ranges are based on publications by EAA, and 25 years experience providing analysis throughout the country from "clean" and "contaminated" residential and commercial buildings. An explanation for the interpretation of data is given in the accompanying information sheet.



As/Pe = Aspergillus/Penicillium, W.I. = Water indicating fungi (Stachybotrys, Chaetomium, Ulocladium), As/Ba = Asco/Basidiospores, Clad = Cladosporium, Oth = Other

**GENERAL AIRBORNE MOLD SPORE INTERPRETATION GUIDELINES**

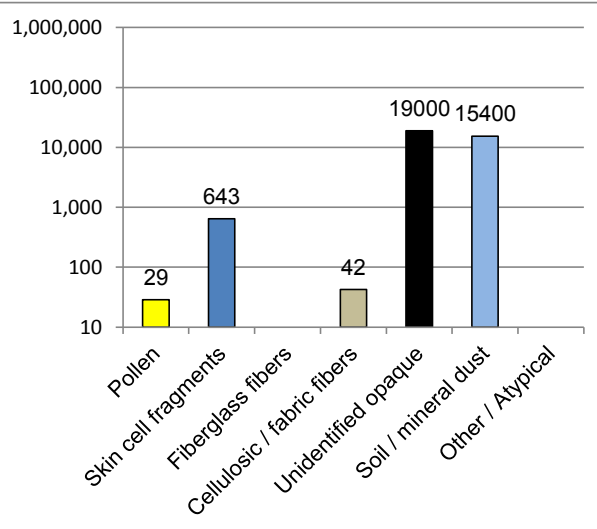
Mold Spore Category	Concen. Range	Distribution Type
Total Spores	Low - moderate	Not applicable
Aspergillus/Penicillium	Typical - low	Source possible
Chronic Water Indicating Fungi	Low	Detected / background
Typical Outdoor Fungi	Typical - low	Moderate infiltration

\*\*"Source" refers to the possible presence of a local mold growth source

All concentrations in particle counts per cubic meter of air (cts/m<sup>3</sup>)

**OTHER AEROSOLS INTERPRETATION GUIDELINES**

Particle Category	Concen. range
Pollen	Detected
Skin cell fragments	Very low
Fiberglass fibers	Not detected
Cellulosic / fabric fibers	Very low
Unidentified opaque	High
Soil / mineral dust	Low - moderate
Other / Atypical	Not detected



**Specific Comments :** High dust.

Photos not requested

**AIRBORNE MOLD AND DUST ANALYSIS**

EAA Method #: DUST-A01

Data Page 2 of 2

(end of data report)

Client Name : Pacific EH&amp;S Services, Inc.

Client Project #: 17-1463

Project description : 17-1463

Requested by : G. Burchell

Date collected : 7/28/17

EAA Project#: 17-0248

Sample received : 7/31/17

Sample condition : Acceptable as received

Client Sample#	Sample Description / Location	General Comments
17-1463-0728-B6	Blank	No trace detected.
AIRBORNE MOLD SPORE CONCENTRATIONS (Cts./m <sup>3</sup> ) -- Spore Trap Sample Analysis		
Category	Sample # -->	High mag. used 600X
17-1463-0728-B6		
Total Mold Spores (Cts/m <sup>3</sup> )		not detected
Alternaria		
Aspergillus/Penicillium		
Ascospores		
Basidiospores		
Botrytis		
Chaetomium		
Cladosporium		
Curvularia		
Drechslera/Bipolaris		
Epicoccum		
Fusarium		
Nigrospora		
Oidium/Peronospora		
Pithomyces		
Rusts		
Smuts / Myxomycetes / Periconia		
Stachybotrys		
Stemphylium		
Torula		
Ulocladium		
Other Hyaline Fungi		
Unidentified Brown Fungi		
Unidentified Fungi		
Hyphae fragments		
Algal / fern spores		
Insect parts		
POLLEN (Total cts/m <sup>3</sup> )		not detected
Not specified		
Pinus		
COMMON AEROSOLS (cts/m3)		
Skin cell fragments		
Fiberglass fibers		
Cellulosic / fabric fibers		
Unidentified opaque		
Soil / mineral dust		
OTHER AEROSOLS (cts/m3)		not detected
Statistical Parameters		
Vol. analyzed (m <sup>3</sup> )-high mag - 600x:		0.016
Detect limit(Cts/m <sup>3</sup> )-high magnification:		62.3
% sample analyzed-high magnification:		23%
Vol. analyzed(m <sup>3</sup> )/entire sple 150-300x:		0.070
* Detection limit (Cts/m <sup>3</sup> )/entire sple:		14.3
* Note: The "entire sample" detection limit applies to the "large" particle categories analyzed during the low magnification examination of the entire sample		
Sample flow rate (lpm):		14.0
Sample trace length (mm):		14.40
Microscope field diameter (mm):		0.330

Note: Sample results are only applicable to the items or locations tested

doc.rev.2 -8/10/16

Raw/extrapolated count data are given on a separate page.

Authorized / data reviewed by :

Daniel M. Baxter

Report date: 8/13/17



## AIRBORNE MOLD AND DUST ANALYSIS

**Client Name :** Pacific EH&S Services, Inc.

**Client Project # :** 17-1463

**EAA Project# :** 17-0248

**Sample # :** 17-1463-0728-B6

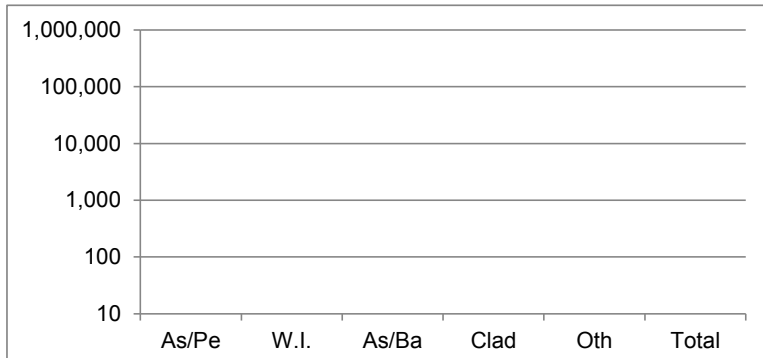
**Project :** 17-1463

**Date Collected :** 07/28/17

**Description :** Blank

*Graphical page 2 of 1*

The following interpretation guidelines are based on the average mold spore and aerosol concentration ranges historically measured in indoor office, commercial, and "clean" residential environments. Residential environments experience higher variation and concentrations of certain bioaerosols. The ranges are based on publications by EAA, and 25 years experience providing analysis throughout the country from "clean" and "contaminated" residential and commercial buildings. An explanation for the interpretation of data is given in the accompanying information sheet.



As/Pe = *Aspergillus/Penicillium*, W.I. = Water indicating fungi (*Stachybotrys*, *Chaetomium*, *Ulocladium*), As/Ba = *Asco/Basidi*spores, Clad = *Cladosporium*, Oth = Other

### GENERAL AIRBORNE MOLD SPORE INTERPRETATION GUIDELINES

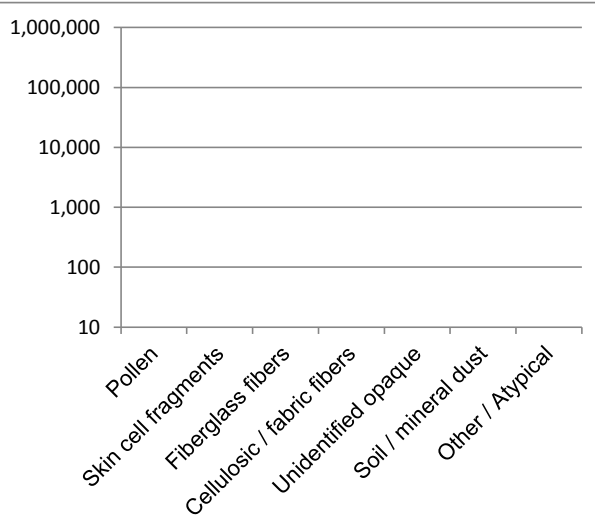
Mold Spore Category	Concen. Range	Distribution Type
Total Spores	Not detected	Not applicable
<i>Aspergillus/Penicillium</i>	Not detected	Normal / typical
Chronic Water Indicating Fungi	Not detected	Not detected
Typical Outdoor Fungi	Not detected	Not detected

*\*\*Source" refers to the possible presence of a local mold growth source*

All concentrations in particle counts per cubic meter of air (cts/m<sup>3</sup>)

### OTHER AEROSOLS INTERPRETATION GUIDELINES

Particle Category	Concen. range
Pollen	Not detected
Skin cell fragments	Not detected
Fiberglass fibers	Not detected
Cellulosic / fabric fibers	Not detected
Unidentified opaque	Not detected
Soil / mineral dust	Not detected
Other / Atypical	Not detected



**Specific Comments :** No trace detected.

Photos not requested



**SURFACE MOLD AND DUST ANALYSIS**

EAA Method #: DUST-D01

Client Name : Pacific EH&amp;S Services, Inc.

Data Page 1 of 1

Client Project #: 17-1463

Project : 17-1463

end of data report

Requested by : G. Burchell

Date collected : 7/28/17

EAA Project#: 17-0248

Date received : 7/31/17

Sample condition : Acceptable as received

Client Sample#	Sample Description / Location	Analysis Comments	Magnification 600X
17-1463-0728-T1	Bedroom 1; "BOE2" window sill	High dust.	
17-1463-0728-T2	Bedroom 1; "BOE2" bed sheets	Moderate-high dust.	
17-1463-0728-T3	Bedroom 2; window sill and blinds	High dust. High pollen.	
17-1463-0728-T4	Bedroom 2; Bedding	Moderate-high dust.	

**SURFACE MOLD SPORE CONCENTRATIONS (Cts./mm<sup>2</sup>)**

Category	Sample # -->	17-1463-0728-T1	17-1463-0728-T2	17-1463-0728-T3	17-1463-0728-T4
<b>Total Mold Spores (Cts/mm<sup>2</sup>)</b>		<b>3.1</b>	<b>not detected</b>	<b>5.3</b>	<b>0.6</b>
Alternaria					
Aspergillus/Penicillium					
Ascospores					
Basidiospores		3.1		1.8	
Botrytis					
Chaetomium					
Cladosporium					
Curvularia					
Drechslera/Bipolaris					
Epicoccum					
Fusarium					
Nigrospora					
Oidium/Peronospora					
Pithomyces					
Rusts					
Smuts / Myxomycetes / Periconia				1.8	
Stachybotrys					
Stemphylium					
Torula					0.6
Ulocladium					
Other Hyaline Fungi					
Other Fungi					
Unidentified Fungi				1.8	
Mycelia fragments				0.9	
Algal / fern spores					
Insect parts					
<b>POLLEN (Total cts/mm<sup>2</sup>)</b>		<b>6.2</b>	<b>not detected</b>	<b>27.5</b>	<b>not detected</b>
Not specified		6.2		27.5	
Pinus					
<b>COMMON AEROSOLS (cts/mm<sup>2</sup>)</b>					
Skin cell fragments		55.9	58.4	74.5	39.1
Fiberglass fibers					
Cellulosic / fabric fibers		20.2	11.2	25.7	23.6
Unidentified opaque		307.0	11.8	170.0	3.7
Soil / mineral dust		287.0	6.8	197.0	9.9
<b>OTHER AEROSOLS (cts/mm<sup>2</sup>)</b>		<b>not detected</b>	<b>not detected</b>	<b>not detected</b>	<b>not detected</b>
<b>Statistical Parameters</b>					
Area analyzed (mm <sup>2</sup> )--mold/aerosols:		0.64	1.61	1.13	1.61
Detect limit(Cts/mm <sup>2</sup> )--mold/aerosols:		1.55	0.62	0.89	0.62
Raw Count Conversion Factor					
Microscopic fields counted :		8	20	14	20
Microscope field area (mm <sup>2</sup> ):		0.08	0.08	0.08	0.08

Results only apply to the items or areas tested.

doc.rev.4 - 3/15/17

Authorized / data reviewed by : Daniel M. Baxter

Date: 8/13/17

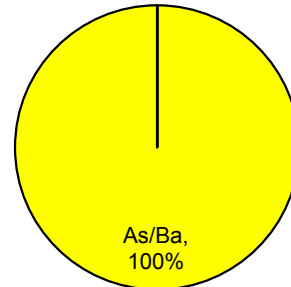
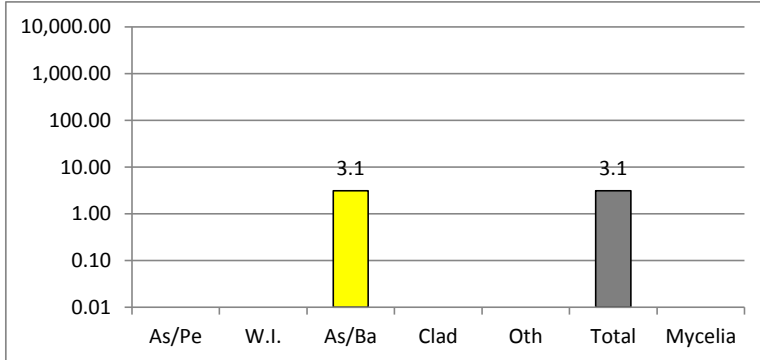
**SURFACE MOLD AND DUST ANALYSIS -Graphical Report**

EAA Method #: DUST-D01

Graphical page 1 - 1

**Client Name :** Pacific EH&S Services, Inc.**Client Project # :** 17-1463**EAA Project# :** 17-0248**Sample # :** 17-1463-0728-T1**Project :** 17-1463**Date Collected :** 07/28/17**Description :** Bedroom 1; "BOE2" window sill

The following interpretation guidelines are based on average surface mold spore and dust concentration ranges historically measured in indoor office, commercial, and "clean" residential environments. Residential environments experience higher variation and concentrations of certain bioaerosols. The ranges are based on publications by EAA, and 25 years experience providing analysis throughout the county from "clean" and "contaminated" residential and commercial buildings. An explanation for the interpretation of data is given in the accompanying information sheet.



As/Pe = Aspergillus/Penicillium, W.I. = Water indicating fungi (Stachybotrys, Chaetomium, Ulocladium), As/Ba = Asco/Basidiospores, Clad = Cladosporium, Oth = Other

**GENERAL SURFACE MOLD SPORE INTERPRETATION GUIDELINES**

Mold Spore Category	Concentration Range	Deposition / Growth
Total Spores / mycelia fragments	Low - moderate	Low-mod. deposition
Aspergillus/Penicillium	Not detected	Normal deposition
Chronic Water Indicating Fungi	Not detected	Not detected
Typical Outdoor Fungi	Low-moderate	Low-mod. deposition

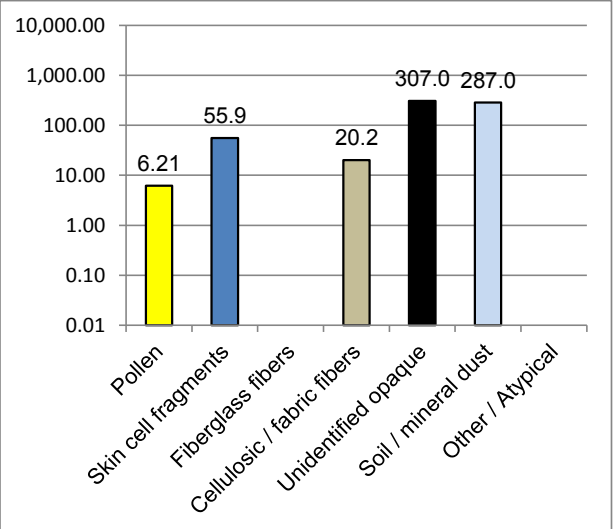
*\*\*"Growth" refers to the possible presence of surface mold growth*

*" \* Growth likely" of typically outdoor fungi*

All concentrations in particle counts per surface area (cts/mm<sup>2</sup>)

**OTHER AEROSOLS INTERPRETATION GUIDELINES**

Particle Category	Concentration range
Pollen	Moderate
Skin cell fragments	Moderate
Fiberglass fibers	Not detected
Cellulosic / fabric fibers	High
Unidentified opaque	High
Soil / mineral dust	High
Other / Atypical	Not detected



**Specific Comments :** High dust.

Photos not requested

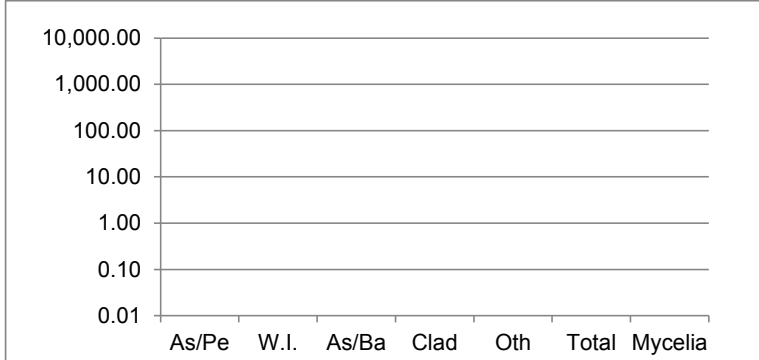
**SURFACE MOLD AND DUST ANALYSIS -Graphical Report**

EAA Method #: DUST-D01

Graphical page 1 - 2

**Client Name :** Pacific EH&S Services, Inc.**Client Project # :** 17-1463**EAA Project# :** 17-0248**Sample # :** 17-1463-0728-T2**Project :** 17-1463**Date Collected :** 07/28/17**Description :** Bedroom 1; "BOE2" bed sheets

The following interpretation guidelines are based on average surface mold spore and dust concentration ranges historically measured in indoor office, commercial, and "clean" residential environments. Residential environments experience higher variation and concentrations of certain bioaerosols. The ranges are based on publications by EAA, and 25 years experience providing analysis throughout the county from "clean" and "contaminated" residential and commercial buildings. An explanation for the interpretation of data is given in the accompanying information sheet.



As/Pe = Aspergillus/Penicillium, W.I. = Water indicating fungi (Stachybotrys, Chaetomium, Ulocladium), As/Ba = Asco/Basidiospores, Clad = Cladosporium, Oth = Other

**GENERAL SURFACE MOLD SPORE INTERPRETATION GUIDELINES**

Mold Spore Category	Concentration Range	Deposition / Growth
Total Spores / mycelia fragments	Not detected	Not detected
Aspergillus/Penicillium	Not detected	Normal / typical
Chronic Water Indicating Fungi	Not detected	Not detected
Typical Outdoor Fungi	Not detected	Not detected

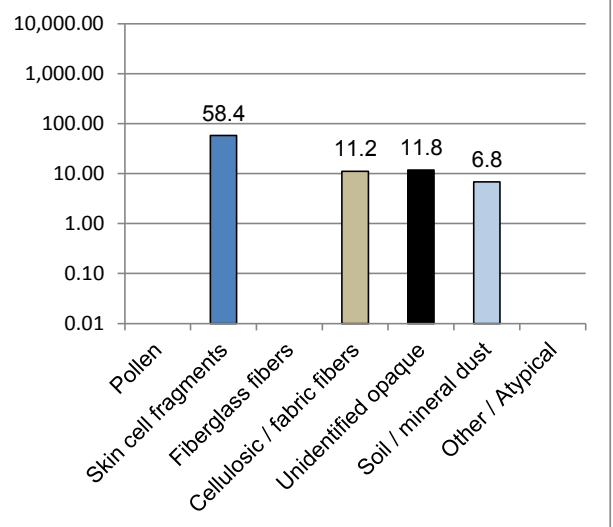
*\*\*"Growth" refers to the possible presence of surface mold growth*

*" \* Growth likely" of typically outdoor fungi*

All concentrations in particle counts per surface area (cts/mm<sup>2</sup>)

**OTHER AEROSOLS INTERPRETATION GUIDELINES**

Particle Category	Concentration range
Pollen	Not detected
Skin cell fragments	Moderate
Fiberglass fibers	Not detected
Cellulosic / fabric fibers	High
Unidentified opaque	Typical / low
Soil / mineral dust	Typical / low
Other / Atypical	Not detected



**Specific Comments :** Moderate-high dust.

Photos not requested

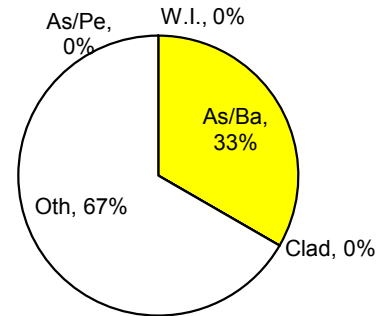
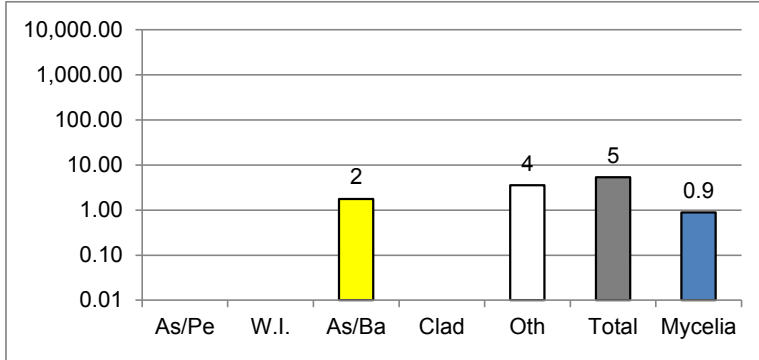
**SURFACE MOLD AND DUST ANALYSIS -Graphical Report**

EAA Method #: DUST-D01

Graphical page 1 - 3

**Client Name :** Pacific EH&S Services, Inc.**Client Project # :** 17-1463**EAA Project# :** 17-0248**Sample # :** 17-1463-0728-T3**Project :** 17-1463**Date Collected :** 07/28/17**Description :** Bedroom 2; window sill and blinds

The following interpretation guidelines are based on average surface mold spore and dust concentration ranges historically measured in indoor office, commercial, and "clean" residential environments. Residential environments experience higher variation and concentrations of certain bioaerosols. The ranges are based on publications by EAA, and 25 years experience providing analysis throughout the county from "clean" and "contaminated" residential and commercial buildings. An explanation for the interpretation of data is given in the accompanying information sheet.



As/Pe = Aspergillus/Penicillium, W.I. = Water indicating fungi (Stachybotrys, Chaetomium, Ulocladium), As/Ba = Asco/Basidiospores, Clad = Cladosporium, Oth = Other

**GENERAL SURFACE MOLD SPORE INTERPRETATION GUIDELINES**

Mold Spore Category	Concentration Range	Deposition / Growth
Total Spores / mycelia fragments	Low - moderate	Low-mod. deposition
Aspergillus/Penicillium	Not detected	Normal / typical
Chronic Water Indicating Fungi	Not detected	Not detected
Typical Outdoor Fungi	Low-moderate	Low-mod. deposition

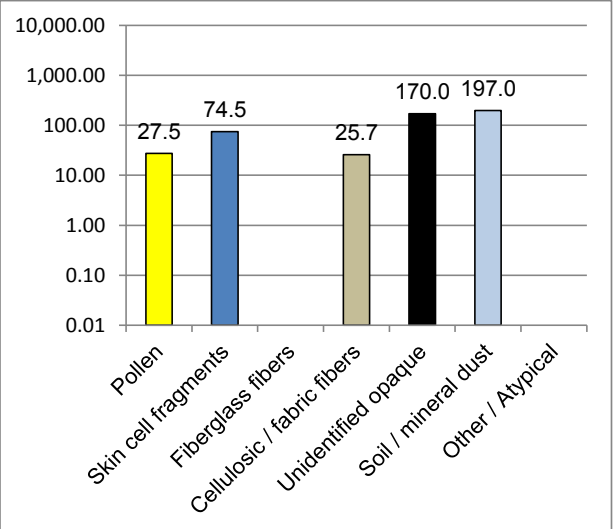
*\*\*"Growth" refers to the possible presence of surface mold growth*

*" \* Growth likely" of typically outdoor fungi*

All concentrations in particle counts per surface area (cts/mm²)

**OTHER AEROSOLS INTERPRETATION GUIDELINES**

Particle Category	Concentration range
Pollen	High
Skin cell fragments	Moderate
Fiberglass fibers	Not detected
Cellulosic / fabric fibers	High
Unidentified opaque	High
Soil / mineral dust	High
Other / Atypical	Not detected



**Specific Comments :** High dust. High pollen.

Photos not requested

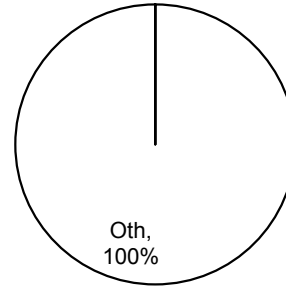
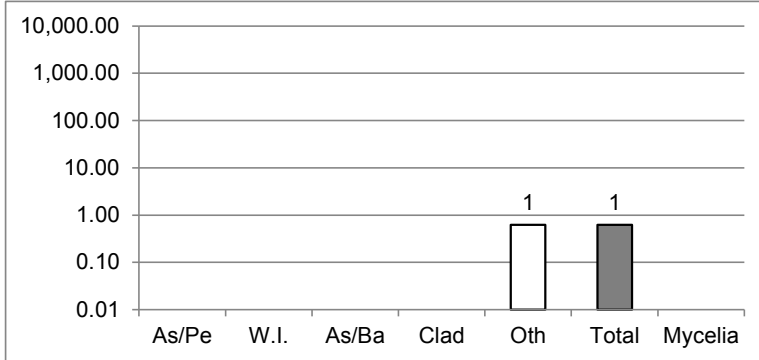
**SURFACE MOLD AND DUST ANALYSIS -Graphical Report**

EAA Method #: DUST-D01

Graphical page 1 - 4

**Client Name :** Pacific EH&S Services, Inc.**Client Project # :** 17-1463**EAA Project# :** 17-0248**Sample # :** 17-1463-0728-T4**Project :** 17-1463**Date Collected :** 07/28/17**Description :** Bedroom 2; Bedding

The following interpretation guidelines are based on average surface mold spore and dust concentration ranges historically measured in indoor office, commercial, and "clean" residential environments. Residential environments experience higher variation and concentrations of certain bioaerosols. The ranges are based on publications by EAA, and 25 years experience providing analysis throughout the county from "clean" and "contaminated" residential and commercial buildings. An explanation for the interpretation of data is given in the accompanying information sheet.



As/Pe = Aspergillus/Penicillium, W.I. = Water indicating fungi (Stachybotrys, Chaetomium, Ulocladium), As/Ba = Asco/Basidiospores, Clad = Cladosporium, Oth = Other

**GENERAL SURFACE MOLD SPORE INTERPRETATION GUIDELINES**

Mold Spore Category	Concentration Range	Deposition / Growth
Total Spores / mycelia fragments	Typical - low	Low deposition
Aspergillus/Penicillium	Not detected	Normal / typical
Chronic Water Indicating Fungi	Not detected	Not detected
Typical Outdoor Fungi	Typical - low	Normal deposition

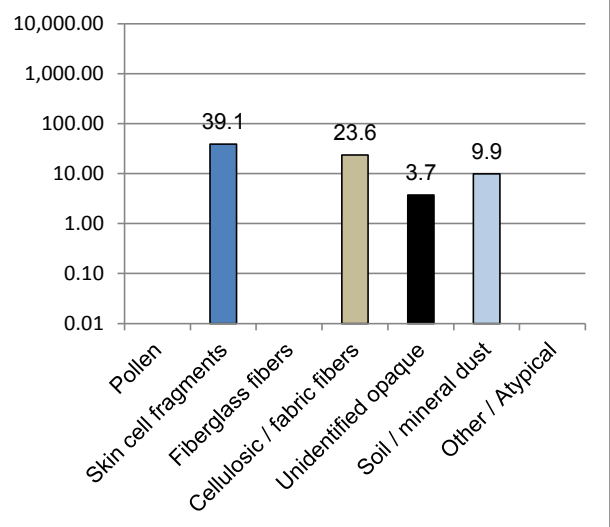
\*\*"Growth" refers to the possible presence of surface mold growth

" \* Growth likely" of typically outdoor fungi

All concentrations in particle counts per surface area (cts/mm<sup>2</sup>)

**OTHER AEROSOLS INTERPRETATION GUIDELINES**

Particle Category	Concentration range
Pollen	Not detected
Skin cell fragments	Low - moderate
Fiberglass fibers	Not detected
Cellulosic / fabric fibers	High
Unidentified opaque	Very low
Soil / mineral dust	Typical / low
Other / Atypical	Not detected



**Specific Comments :** Moderate-high dust.

Photos not requested



# SURFACE MOLD SPORE INTERPRETATION GUIDELINES

Developed by Environmental Analysis Associates, Inc. - 2013

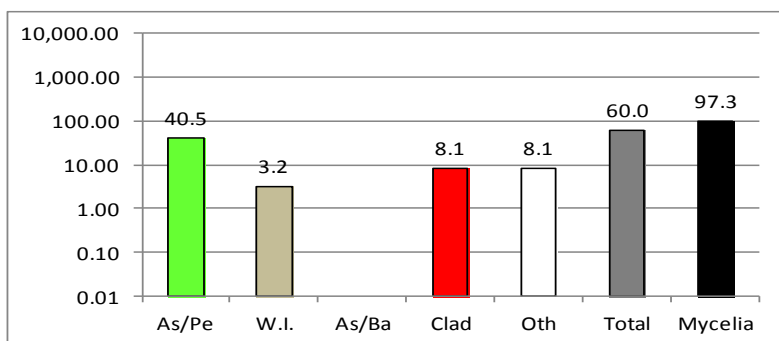
5290 Soledad Road, San Diego, CA 92109 - 858-272-7747

The surface dust interpretation guidelines are based on the average mold spore and aerosol concentration ranges expected indoors. The ranges are based on publications by EAA, and 25 years experience providing analysis throughout the country from "clean" and "contaminated" residential and commercial buildings. Exceptions to any guidelines are always possible, especially in some geographic areas of high vegetation (heavily forested) or low vegetation (desert / snow covered).

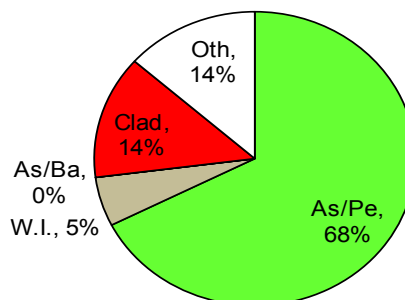
Category	Abbrev.	Description / Definition
Total Spores	Total	Total of all enumerated spores
Aspergillus/Penicillium	As/Pe	Spores with Penicillium or Aspergillus morphology
Chronic Water Indicating Fungi	W.I.	Spores consistent wi. "chronic" moisture (Stachybotrys, Chaetomium, Ulocladium)
Typical Outdoor Fungi	--	Spores commonly found in outdoor air (Asco/Basidiopores, Cladosporium, Other)

There is no direct relationship between indoor and outdoor surface mold spore concentrations. Existing peer reviewed mold concentration literature typically refers to indoor/outdoor comparisons of air samples. The variability and magnitude of measured settled surface concentrations can naturally vary by approximately 3 orders of magnitude from less than 0.1 spores/mm<sup>2</sup> to as high as 100 spores/mm<sup>2</sup> depending on environmental factors, location, and housekeeping. When "growth" is present, indoor surface spore concentrations and growth structures (mycelia) range from 100 fungal structures/mm<sup>2</sup> to over 100,000 fungal structures/mm<sup>2</sup>. "High" concentrations have no correlation or relationship to an airborne hazard and simply indicate the presence or absence of growth.

Example Spore Concentration Graph (ct/mm<sup>2</sup>)



Example Genera Distribution Graph (%)



A series of algorithms using baseline research data developed by EAA simultaneously employ both the concentration and distribution of historical mold spore data to classify the results as compared to average "clean" indoor environments. Fundamental threshold limits of concentration (regardless of outdoor concentrations) are first used to categorize Aspergillus & Penicillium, and Chronic Water Indicating (W.I.) fungi categories as "High", "Moderate", "Low-moderate", "Normal / Typical", and "Low". The Genera distribution is further used to indicate potential indoor growth "sources" verses outdoor "infiltration". The determination of actual indoor growth (in the absence of high spore concentrations) requires the presence of significant "mycelia" growth or other types of growth structures.

## BASIC ALGORITHMS - For Average Buildings

Classification	Concentration (Cts/mm <sup>2</sup> )			Genera Distribution (Potential Indoor / Outdoor source)			
	As/Pe	W.I.	Outdoor fungi	Classification	As/Pe %	W.I. ct/mm <sup>2</sup>	Outdoor fungi %
Low	<1.0	<0.1	<0.1	Low (indoor distribution)	<20%	<0.1	<20%
Typical / low	>1.0	>0.1	>0.1	Typical / low	>20%	>0.1	>20%
Low - moderate	> 10	>1.0	>1.0	Source possible	>30%	>1.0	>50%
Moderate	>20	>5	>10	Indoor source present	>50%	>10.0	>70%
High	>50	>10	>20	Outdoor infiltration			>20 ct/mm <sup>2</sup>

Although no classification system used to estimate the potential for "contamination" can be perfect, EAA's system follows the basic guidelines outlined in the ACGIH 1999 document Bioaerosols: Assessment and Contro and field experience. The calculations use baseline data collected inside buildings, and the variability of concentration and distribution when spore concentrations are relatively low.



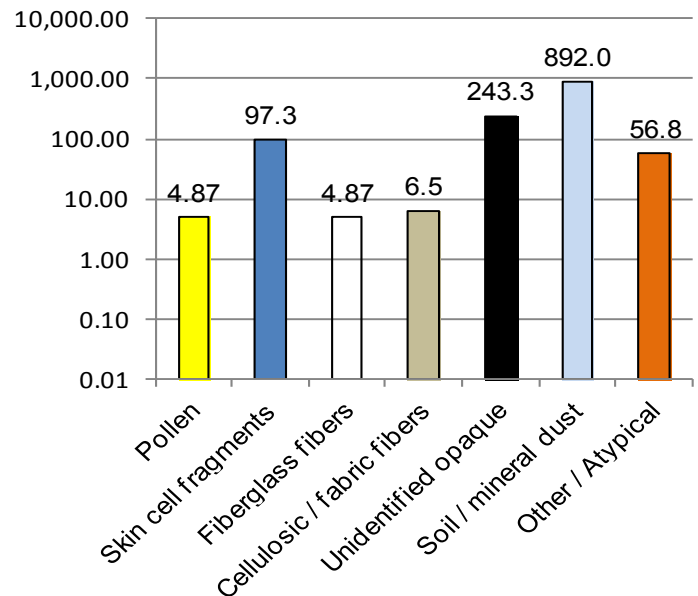
# SURFACE DUST INTERPRETATION GUIDELINES

Developed by Environmental Analysis Associates, Inc. - 2013

5290 Soledad Road, San Diego, CA 92109 - 858-272-7747

The aerosol categories used by EAA provide an assessment of the most common dust contaminants within buildings. These indicator categories measure the impact of occupant activity, building maintenance, and dust generated from HVAC systems, building furnishings, or renovation activities. The measured concentrations and assessment of "high" or "moderate" or "low" levels should not be used as indicators of "safe" or "unsafe" conditions, nor should they be confused with EPA or OSHA exposure guidelines. These guidelines are useful as relative comparison criteria in the assessment of buildings. The relevance with building conditions of each aerosol category are illustrated in the EAA Method guide online on the "News and Information Page" at [eaabaxter.com](http://eaabaxter.com)

Example Dust Concentration Graph (ct/mm<sup>2</sup>)



CATEGORY	DESCRIPTION
Pollen	Reproductive spores of flowers
Skin cell fragments	Epithelial cells / dander
Fiberglass	Man-made fibrous glass fibers
Cellulose	Cellulosic, fabric, & synthetic fibers
Uniden. Opaque	Opaque debris biogenic decay / corrosion
Soil / mineral	Crystalline minerals & construction particles
Fire residue	Combustion soot, ash, & char
* Other	Specific unusual / atypical particles (Concentration range similar to cellulose range)

No quantitative assessment or graphical criteria used:

Insect parts	Concentration range similar to cellulose range
Algae/Fern spores	Concentration range similar to cellulose range

## BASIC ALGORITHMS - For Average Buildings

Concentration (Cts/mm<sup>2</sup>)

Classification	Pollen	Skin Cell Fragments	Fiberglass	Cellulose	Unidentified Opaque	Soil / Minerals	Fire Residue	* Other
Low	<1.0	<1.0	<0.1	<0.1	<10	<5	<1	<0.1
Typical / low	>1.0	>1.0	>0.1	>0.1	>10	>5	>1	>0.1
Low - moderate	>2.0	>10.0	>0.5	>1.0	>20	>10	>5	>1.0
Moderate	>5.0	>50.0	>0.7	>5.0	>50	>50	>10	>5.0
High	>10.0	>100.0	>1.0	>10.0	>100	>100	>50	> 10

\* Reported individually under the Special Comments Section - Concentration ranges may vary by type of particle

*Note: Pollen level assessment criteria are based on the prevalence of pollen encountered by EAA in indoor environments and not by the general assessment criterion published by the National Allergy Bureau for outdoor levels.*

Although no classification system used to estimate potential contamination can cover all conditions, EAA's system follows the basic guidelines outlined in Chapter 14.2.2 of the ACGIH 1999 document Bioaerosols: Assessment and Control by accounting for average baseline data inside buildings. Average levels measured inside buildings without routine HVAC supplied air, or residential dwellings may be higher. **These concentration levels should not be used to assess wall cavities or confined spaces.**



17-0248

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# REQUEST FOR ANALYSIS

PROJECT NO.	17-1463	NOTES: Please pay special attention to insects & insect parts, as well as dander & potential allergens.
PURCHASE ORDER NO.		
DATE SUBMITTED	7-28-17	
LAB DESTINATION	EAA	
TURNAROUND REQUESTED	Standard	

[illegible]

CHAIN OF CUSTODY	PRINT NAME	SIGNATURE	DATE & TIME
RELINQUISHED BY	Grant Birchell	<i>[Signature]</i>	7-28-17 12:05
RECEIVED BY	Daniel M. Ruff	Dan Barker	7/31/17 12:24
RELINQUISHED BY			
RECEIVED BY	J. Zmalk	J. Zmalk	8/1/17 12:30
RELINQUISHED BY			
RECEIVED BY			



*Indoor Air Quality Questionnaire*

The City Safety Office received seven completed questionnaires on October 19, 2017 and nine completed questionnaires on November 3, 2017. One questionnaire from those received on October 19, 2017 was voided. The findings are the following:

**Questionnaires received by Job title (15 participants)**

- 7 Firefighters
- 3 Fire Captains
- 4 Firefighters/Paramedics
- 1 Fire Engineer

**Description of air quality concerns**

Firefighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>• Some people constantly getting sick or getting skin irritations</li> <li>• Multiple crew members have gotten coughs</li> <li>• Possible mold in vents</li> <li>• Moldy odor coming from the leaks and the AC vents</li> <li>• Visible mold: kitchen, upstairs and dorms next to App Bay</li> <li>• Building is old, dirty and causes congestion regularly</li> </ul>	<ul style="list-style-type: none"> <li>• Air quality has been an issue at this fire station over my 15 yr career and it is smelly and musty in the captain's office</li> <li>• This station has poor air quality; we are subject to diesel fumes, we have had numerous leaks during rainy season without any repairs being performed; filters have not been changed</li> </ul>	<ul style="list-style-type: none"> <li>• Visible mold and leaks throughout FS9</li> <li>• At the gym - chest gets tight when on the treadmill</li> <li>• HVAC system old and contaminated</li> </ul>	<ul style="list-style-type: none"> <li>• Air quality in the dorms and living areas; mold and other airborne contaminants</li> </ul>

**Common Problems Listed**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>• Water damage from leaks</li> <li>• Visible mold on walls and air ducts vents that come back after being cleaned with bleach</li> <li>• Mold odor; lack of fresh air</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of fresh air: 2</li> <li>• Dust in the air: 3</li> <li>• Visible mold: 2</li> <li>• Mold odor: 2</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of fresh air: 4</li> <li>• Visible mold: 4; Water leak</li> <li>• Dust in the air: 2</li> <li>• Rodents/mites: 1</li> </ul>	<ul style="list-style-type: none"> <li>• Dust in air; mold odor; visible mold</li> </ul>

**How long they have been assigned to the station**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"><li>• 5 years</li><li>• 2 months</li><li>• 4 months: 3</li><li>• 5 months</li><li>• 6 months</li></ul>	<ul style="list-style-type: none"><li>• 1 year</li><li>• 3 to 4 months</li><li>• 6 months</li></ul>	<ul style="list-style-type: none"><li>• 2 years 9 months</li><li>• 1 month</li><li>• 6 months</li></ul>	<ul style="list-style-type: none"><li>• 10 years</li></ul>

**When they noticed that the building conditions begin**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"><li>• In the last 3 years</li><li>• April 2017</li><li>• June 2017, when I got transferred</li><li>• Two months ago (August 2017)</li><li>• July 2017</li><li>• Since I started working here: 2</li></ul>	<ul style="list-style-type: none"><li>• Throughout my career here but it got worse this year</li><li>• June 2017</li><li>• August 2016</li></ul>	<ul style="list-style-type: none"><li>• June 2014</li><li>• September 2017</li><li>• April 2017</li><li>• February 2017</li></ul>	<ul style="list-style-type: none"><li>• October 2016</li></ul>

**How many hours per week they spend in the fire station**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"><li>• 56 hours</li><li>• 96 hours</li><li>• 72 hours</li><li>• 120 hours</li></ul>	<ul style="list-style-type: none"><li>• 50-60 hours</li><li>• 56 hours</li></ul>	<ul style="list-style-type: none"><li>• 24-144 hours</li><li>• 56 hours</li><li>• 72 hours</li></ul>	<ul style="list-style-type: none"><li>• 96 hours</li></ul>

**List areas within the building which you frequent on a routine basis**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>Apparatus bay, sleeping quarters, kitchen</li> <li>Gym, bathroom</li> <li>All areas</li> </ul>	<ul style="list-style-type: none"> <li>Kitchen, apparatus room, gym, captain's office/bedroom</li> <li>Dorms, office, weight room</li> <li>All throughout the station</li> </ul>	<ul style="list-style-type: none"> <li>Upstairs; dorms/TV room; kitchen; gym; computer room; bathroom; locker room; App bay</li> </ul>	<ul style="list-style-type: none"> <li>Dorms, gym, TV room, kitchen, bathroom, apparatus bay</li> </ul>

**Following conditions apply to them**

- Operate video display terminals at least one hour/average day (computer screens, phones, tablets, MDT displays, etc.)
- Use of cleaning products
- Smoke products, tobacco, vaping, or other (diesel fumes): 1
- Wear contact lenses: 1

**Use any chemical substances such as cleaners, detergent, white out, etc.**

Fire Fighters	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>Bleach, detergent, Windex, metal polish, oven cleaner, simple green</li> </ul>	<ul style="list-style-type: none"> <li>Sani wipes, windex</li> </ul>	<ul style="list-style-type: none"> <li>Windex, De-greaser, DEF (diesel exhaust fluid?), diesel fuel</li> </ul>

**Health issues being diagnosed since they have worked in the building**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>None: 4</li> <li>Allergies, sinusitis</li> </ul>	<ul style="list-style-type: none"> <li>None: 2</li> <li>Allergic rhinitis, bronchitis, allergies</li> </ul>	<ul style="list-style-type: none"> <li>None</li> <li>Conjunctivitis</li> </ul>	<ul style="list-style-type: none"> <li>Allergies, other chest condition</li> </ul>

**Symptoms experience during the last year while working in the building (multiple answers)**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>• Frequent cough: 4</li> <li>• Eye irritation: 1</li> <li>• Congestion: 5</li> <li>• Skin irritation: 1</li> <li>• No symptoms: 1</li> <li>• Multiple colds: 2</li> <li>• Constantly clear my throat: 1</li> <li>• Fever/headache: 1</li> </ul>	<ul style="list-style-type: none"> <li>• Frequent cough: 3</li> <li>• Multiple colds (&gt;4 colds): 2</li> <li>• Migraines, skin irritation</li> <li>• Congestion: 3</li> <li>• headache after every shift</li> <li>• Wheezing, shortness of breath.</li> </ul>	<ul style="list-style-type: none"> <li>• Frequent cough: 2</li> <li>• Multiple colds (&gt;4 colds): 1</li> <li>• Eye irritation: 2</li> <li>• Skin irritation: 2</li> <li>• Congestion: 3</li> <li>• Headache (at least 2/month)</li> <li>• Eye</li> </ul>	<ul style="list-style-type: none"> <li>• Frequent cough, wheezing (except colds), multiple colds (&gt;4 colds), shortness of breath, eye irritation, skin irritation, rashes, congestion</li> </ul>

**Most severe symptom**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>• Skin irritation</li> <li>• Constant cough</li> <li>• Congestion</li> <li>• Nasal congestion</li> </ul>	<ul style="list-style-type: none"> <li>• Headaches, colds</li> <li>• Wheezing/cough</li> <li>• Nasal congestion</li> </ul>	<ul style="list-style-type: none"> <li>• Cough</li> <li>• Congestion</li> <li>• Eye infection</li> </ul>	<ul style="list-style-type: none"> <li>• Rash, shortness of breath</li> </ul>

**How often they experienced the symptoms**

Fire Fighters	Fire Captains/ Fire Engineer/ Firefighters/Paramedics
<ul style="list-style-type: none"> <li>• 2 to 4 times a week</li> <li>• Once a month</li> <li>• Very rarely</li> <li>• Mid-set, usually until days off</li> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Once a day: 3</li> <li>• Once a week: 2</li> <li>• Once a month</li> <li>• Whenever at station 9</li> <li>• Once</li> </ul>

**Any health problems or allergies which might account for any of the above symptoms that have not been diagnosed by a HCP**

- Yes, dust allergy

**When the symptoms started**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"><li>• Around July 2017</li><li>• A few months ago</li><li>• A few weeks after starting at Station 9</li></ul>	<ul style="list-style-type: none"><li>• Since working at station 9</li><li>• Approx. 2 weeks ago</li></ul>	<ul style="list-style-type: none"><li>• 9 months ago, after being assigned</li><li>• 9/30/17</li><li>• Started spending prolonged time at FS9</li><li>• 1 year</li></ul>	<ul style="list-style-type: none"><li>• After being at the station for more than 24 hours. Symptoms are generally worst at night/morning</li></ul>

**When the symptoms are generally worst**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"><li>• On 72 hours</li><li>• After waking up at the station/mornings</li><li>• At night when the AC is ON</li><li>• Mid-way through my set</li><li>• After working a lot</li></ul>	<ul style="list-style-type: none"><li>• When I wake up in the morning</li><li>• Night time</li><li>• Not sure; worst at work</li></ul>	<ul style="list-style-type: none"><li>• After a 72-hour shift or end of set</li><li>• Wake up</li><li>• Night (most likely lack of sleep)</li></ul>	<ul style="list-style-type: none"><li>• At night/morning</li></ul>

**When the symptoms clear up**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"><li>• They go away on vacation: 7</li><li>• Symptoms go away by the morning</li></ul>	<ul style="list-style-type: none"><li>• They go away on vacation: 2</li><li>• Symptoms do not clear after leaving work</li></ul>	<ul style="list-style-type: none"><li>• Symptoms do not away by the morning: 2</li><li>• Symptoms clear up within 1 day after leaving work</li><li>• they go away on vacation</li></ul>	<ul style="list-style-type: none"><li>• They go away on vacation</li></ul>

**Which symptoms persist away from their workplace throughout the week**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>• Eye irritation (new)</li> <li>• Congestion</li> </ul>	<ul style="list-style-type: none"> <li>• Headaches</li> <li>• All symptoms persist</li> </ul>	<ul style="list-style-type: none"> <li>• Cough</li> <li>• Congestion</li> </ul>	<ul style="list-style-type: none"> <li>• Rash</li> </ul>

**Taking any medication or seeking medical attention for their symptoms**

Fire Fighters	Fire Captains	Firefighters-Paramedics/ Fire Engineer
<ul style="list-style-type: none"> <li>• No: 5</li> <li>• Yes: 1; Allergy Meds</li> </ul>	<ul style="list-style-type: none"> <li>• No: 2</li> <li>• Yes: 1</li> </ul>	<ul style="list-style-type: none"> <li>• No medication: 5</li> </ul>

**Sought professional medical attention for their symptoms**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>• No: 5</li> <li>• Yes: 1</li> </ul>	<ul style="list-style-type: none"> <li>• No: 2</li> <li>• Yes: 1</li> </ul>	<ul style="list-style-type: none"> <li>• Yes: 2</li> <li>• No: 1</li> </ul>	<ul style="list-style-type: none"> <li>• Yes: 1</li> </ul>

**Other people with similar symptoms or concerns**

Fire Fighters	Fire Captains/ Firefighters-Paramedics/ Fire Engineer
<ul style="list-style-type: none"> <li>• Yes, [redacted] (cough), [redacted] (many symptoms), [redacted] (rash)</li> <li>• Other visitors</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> <li>• [redacted]</li> <li>• No: 1</li> </ul>

**Indoor air quality of this station compared to other fire station such as station 12 or 17**

Fire Fighters	Fire Captains/ Firefighters-Paramedics/ Fire Engineer
<ul style="list-style-type: none"> <li>• Average: 3</li> <li>• Poor: 4</li> </ul>	<ul style="list-style-type: none"> <li>• Poor: 8</li> </ul>

**The problem occurs more frequently during specific seasons of the year**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>Do not know: 7</li> <li>After it rains, it has a moldy smell</li> <li>Mid-way through my set, I do not know a specific time and I do not see a dust or any airborne substance</li> </ul>	<ul style="list-style-type: none"> <li>Do not Know: 3</li> <li>There was an extreme weather patten (temperatures near 100F) that cooled off rapidly. This pattern occurred during a similar time frame to my symptoms</li> <li>Temperature changes; AC is poor in the facility</li> </ul>	<ul style="list-style-type: none"> <li>No: 2</li> <li>At night/ early morning</li> <li>When it rains, mold and leaks</li> <li>Do not know</li> </ul>	<ul style="list-style-type: none"> <li>Yes; summer most likely to be associated with IAQ problems; winter least likely</li> <li>The weather is hotter = the AC is turned up and the allergens are released</li> <li>The IAQ problems seem to be more notable when the AC is running on high</li> </ul>

**Any calls/incidents in the last three months to draw attention (chemical spills, hazmat response, fire, etc.) that may have contributed to their symptoms**

Fire Fighters/ Fire Captains/ Firefighters-Paramedics/ Fire Engineer
<ul style="list-style-type: none"> <li>No: 14</li> </ul>

**Any change in how their PPE has been maintained, cleaned, and stored**

Fire Fighters	Fire Captains	Fire Engineer
<ul style="list-style-type: none"> <li>No: 4</li> </ul>	<ul style="list-style-type: none"> <li>No: 2</li> </ul>	<ul style="list-style-type: none"> <li>Uniform such as shirt and pants are washed with natural detergents</li> </ul>

**Condition of the flooring**

Fire Fighters	Firefighters/Paramedics	Fire Captains
<ul style="list-style-type: none"> <li>The tile is old and there was a leak below wood floor in the locker rooms</li> <li>Floor is old and damaged</li> </ul>	<ul style="list-style-type: none"> <li>Carpet in gym; epoxy coated tile in bathrooms/kitchen</li> </ul>	<ul style="list-style-type: none"> <li>Extremely worn out</li> <li>Carpet: very poor (dirty/discolored)</li> </ul>



<ul style="list-style-type: none"> <li>• Carpet is worn in the majority of the station; Kitchen floor is also worn</li> <li>• Rubber mats, cement floor in apparatus bay, tile in restroom, older, not worn/damaged</li> <li>• Rubber floors and my home has hardwood floors</li> <li>• Poor; stained carpeting/cracked tile</li> <li>• Good</li> </ul>	<ul style="list-style-type: none"> <li>• Carpet and the floors seem to be as old as the bldg..</li> </ul>	<ul style="list-style-type: none"> <li>• Tile: very poor (broken tiles, mold, cracks)</li> </ul>
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**Work activities that generate dust/particulates or other where PPE may not be in use**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>• No: 1</li> <li>• Yes: 4; cleaning/maintaining tools; training; overhaul; fires</li> </ul>	<ul style="list-style-type: none"> <li>• Yes, daily life in the fire station</li> <li>• No</li> </ul>	<ul style="list-style-type: none"> <li>• Yes, fire suppression</li> <li>• General cleaning (moping, dusting)</li> </ul>	<ul style="list-style-type: none"> <li>• No</li> </ul>

**How clean the workspace is - crew members do the cleaning**

Fire Fighters	Fire Captains/ Fire Engineer	Firefighters/Paramedics
<ul style="list-style-type: none"> <li>• Dusty/dirty: 1</li> <li>• Average: 3</li> <li>• Clean: 4</li> </ul>	<ul style="list-style-type: none"> <li>• Dusty/dirty: 3</li> </ul>	<ul style="list-style-type: none"> <li>• Clean: 2</li> <li>• Average: 1</li> <li>• Dusty/dirty: 1</li> </ul>

**Persistent odors an issue**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>• No: 6</li> <li>• Yes: 1 (mold smell)</li> </ul>	<ul style="list-style-type: none"> <li>• Yes: 1</li> <li>• No: 1</li> </ul>	<ul style="list-style-type: none"> <li>• No: 2</li> <li>• Yes: 2</li> <li>• Exhaust; smells moldy and stagnant air</li> </ul>	<ul style="list-style-type: none"> <li>• Yes, diesel exhaust</li> </ul>

**Evidence of water leaks or visible signs of moisture in an around workspace**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>• Yes: 7</li> <li>• After the last rainy season, there is a leak above the kitchen. There was a leak in the locker rooms</li> <li>• Kitchen ceiling has had water damage for a very long time</li> <li>• Leaking roof in kitchen and leaking walls in gym</li> <li>• No response and no action have taken place</li> </ul>	<ul style="list-style-type: none"> <li>• Yes: 3</li> <li>• I was not here for the damage</li> <li>• Obvious water damage to kitchen ceiling, walls next to stairs to 2<sup>nd</sup> floor</li> <li>• Ceiling has experience multiple leaks in kitchen and dayroom. Ceiling needs repair from leaks. This has been an issue that has been ongoing and reported since prior to my time at this station</li> </ul>	<ul style="list-style-type: none"> <li>• Yes: 4</li> <li>• Gym wall and kitchen ceiling, paint is peeling away where kitchen leaks are</li> <li>• Ceiling in kitchen has water damage</li> <li>• Odd build up around vent in gym</li> </ul>	<ul style="list-style-type: none"> <li>• Yes, water leaks in kitchen and gym (February 2017)</li> </ul>

**Any renovation/demolition related activities occurring in or near their work environment**

Fire Fighters	Fire Captains/ Fire Engineer	Firefighters/Paramedics
<ul style="list-style-type: none"> <li>• No: 6</li> <li>• Yes: 1, new carpet</li> </ul>	<ul style="list-style-type: none"> <li>• Yes, roof repair: 2</li> <li>• Re-roofed over kitchen leak (August); new carpet installed in dayroom; new kitchen chairs</li> <li>• No</li> </ul>	<ul style="list-style-type: none"> <li>• No: 3</li> <li>• Yes: 1</li> <li>• New roof or part of it</li> <li>• New carpet right before I got assigned to FS9</li> </ul>

**Frequently complaints concerning the indoor air quality at this building**

Fire Fighters/Fire Captains/ Firefighters-Paramedics Fire Engineer (multiple answers)
<ul style="list-style-type: none"> <li>• Stuffy air: 11</li> <li>• Moldy odors: 5</li> <li>• Dusty: 8</li> <li>• Noisy: 5</li> <li>• Poor lighting: 3</li> <li>• Crowded area: 10</li> </ul>

- No complains: 1
- Temperature too cold: 2
- Temperature too hot: 4

**What they think the problem is**

Fire Fighters	Fire Captains	Firefighters/Paramedics	Fire Engineer
<ul style="list-style-type: none"> <li>• Station is old and too small for personnel assigned here</li> <li>• Do not know</li> <li>• Mold and dirty air ducts</li> <li>• Not sure</li> <li>• Mold in the walls</li> </ul>	<ul style="list-style-type: none"> <li>• Black mold, age of building, exhaust from the fire engines and main road</li> <li>• Unsure (mold/moisture)</li> <li>• Station is old and in disrepair; it is in serious need of remodel, modernization. Leaks to be repaired, carpet and tiles replaced, too many things to list</li> </ul>	<ul style="list-style-type: none"> <li>• Poor AC; very old bldg.; leaks/mold</li> <li>• Bldg has never been updated; water leak should be addressed</li> </ul>	<ul style="list-style-type: none"> <li>• Mold in the air ducts, contaminants in the reclining chairs</li> </ul>

**Comments or observations that may be helpful in determining the environmental condition of their workplace**

- Opening the walls to look for leaks. Clearing out the old insulation. Replacing the old paint. New AC ducting
- Look into the venting; take paint flake samples

*Limited Preliminary Fungal Investigation and Deep Cleaning Protocol*



TECHNICAL AND ADVISORY SERVICES • ENVIRONMENTAL HEALTH AND SAFETY

December 13, 2017

Joleen Richardson, CSP  
City Safety Officer  
City of Long Beach  
333 West Ocean Blvd., 10th Floor  
Long Beach, CA 90802

Re: Limited preliminary fungal investigation and deep cleaning protocol preparation related to the City of Long Beach, Fire Station #9, 3917 Long Beach Blvd., Long Beach, CA; HSA Project Number 180034LA.

Dear Ms. Richardson:

Pursuant to your request, Health Science Associates (HSA) provided Industrial Hygiene support related to the subject investigation. This investigation was performed to determine whether water intrusion events which occurred in the building provided conditions that allowed for fungal growth to occur.

The evaluation and inspection was performed by Howard J. Ozar, Certified Industrial Hygienist (CIH) assisted by Kirk A Cavalier, Sr., California Certified Site Surveillance Technician (SST) and California Department of Public Health (CDPH) Lead Sampling Technician (LST). Project management and overview were performed by Joel I. Berman, CIH, Certified Safety Professional (CSP), CAC, Certified Indoor Air Quality Manager (CIAQM), CDPH LST, Vice President.

## **HISTORY**

The brief history that was provided to HSA is that the subject building was constructed as a fire station in 1939 as part of the New Deal related to the Presidency of Franklin Delano Roosevelt. The area surrounding the fire station was mostly farm land when the station was constructed. There have been a variety of renovations to the building since its original construction.

During the rain storms of 2016-2017 there were a variety of reported roof and other leaks into the building. On October 23, 2017 HSA performed a job walk of the building to determine areas where specific inspections should occur. The areas discussed included the areas that were affected by the recent rain storms and an area where the floor had collapsed. These areas are identified below.

1. The crawlspace, especially under the shower area of the building (along the eastern portion of the building, floor collapse area).
2. The kitchen ceiling area.
3. The attic above the kitchen (this area is accessible through the attic access located in the second floor women's bathroom/shower area).
4. The under stairwell storage closet.
5. The northeast corner of the exercise room.
6. The east wall of the captain's office (boroscope at the base of the wall).
7. The south wall of the engine garage (boroscope at the base of the wall).
8. The cupola on the roof, if possible.
9. The movie room and a couple of the sleeping rooms on the second floor.
10. The windows in the bedrooms of the second floor (boroscope at the base of the wall, rooms 1, 2, and 3).

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11. Ensure that clogged roof drains were cleaned (ask so that they may not need to be inspected).

In addition to the above areas of the building, during our inspection of the site, HSA determined that there was a heavy layer of dirt on various surfaces of the occupied areas of the building. This indicated that the cleaning of the building had missed various obvious surfaces, which had extremely heavy dust layers present. These areas included, but were not limited to, the wall mounted television (TV) supports, the tops of door jambs, and the tops of cabinets. A few of these areas were photographically documented during the October 23, 2017 job walk. Therefore, HSA was requested to prepare a deep cleaning protocol for the building.

Additionally, during the job walk, HSA discovered that a return ductwork line, in the second floor attic space/mechanical area had been capped-off, but the ductwork was not collapsed. Therefore, it appeared that this ductwork is not completely sealed and is possibly drawing air into the heating, ventilation, and air conditioning (HVAC) system and distributing attic space air into the occupied spaces of the building.

## **SITE INVESTIGATION**

During the investigation of the building, HSA was able to access a variety of the above identified areas. This included the cupola, the attic space above the kitchen, various interior wall areas of the building, and various wall space/cavity areas using a boroscope.

The site investigation confirmed that the majority of the areas of the building have an elevated level of settled dust on various surfaces. Additionally, visible suspect fungal growth was observed to be present in the following three areas of the building: The kitchen ceiling, room side, the kitchen ceiling, attic side; and the exercise room. In addition to these three areas, the boroscope also determined that there was an additional area of visible suspect fungal growth present inside of the north wall of room three, on the second floor of the station (determined via boroscope investigation).

The crawlspace of the building, especially the location proximal to the previous collapse was visually inspected. There was no visible suspect fungal growth in the area.

Photographs of both the October 23, 2017 job walk and the November 29, 2017 site visit are included in Appendix I.

## **METHODS**

### **FUNGAL SURFACE SAMPLING**

Total spore surface samples were collected using transparent adhesive Bio-tape to "trap" the spores and "lift" them from the test surface for later laboratory analysis. The tape that was utilized came pre-installed on a plastic microscope slide in an individual case with a protective film over the adhesive area to prevent contamination of the media prior to collecting a sample. After donning Nitrile gloves, a slide was removed from its case and the protective film was removed from the tape area. The tape was then pressed onto the "test" surface, gently tapped by hand, removed from the test surface, and then re-inserted into the case it came in. The microscope slide was then labeled, the case closed, and transported via chain-of-custody-procedures to LA Testing's Huntington Beach laboratory for analysis. A measurement of total

spore count provided the relative numbers and types of spores on a specific building surface (spores/square millimeter). This method also allows for the differentiation between live (viable spores) or dead spores.

Tape surface samples provide a mechanism to evaluate general surface areas for total spore count. High total surface spore counts may be indicative of fungal contamination of the surfaces represented by the sample. Tape surface sampling also provides a mechanism to microscopically verify that visually suspect areas are clearly fungal growth rather than "dirt" that has a fungal-like appearance, or vice versa.

## **BOROSCOPE**

A boroscope is an optical device consisting of a flexible tube with an eyepiece on one end, an objective lens and light on the other linked together by an optical fiber relay system in between. An internal image of the illuminated surface is formed by the objective lens and magnified by the eyepiece which presents it to the viewer's eye.

## **LABORATORY**

After sample collection, all samples requiring laboratory analysis were transported via chain-of-custody procedures to LA Testing's Huntington Beach, CA laboratory for analysis. LA Testing is part of a larger, nation-wide laboratory organization known as EMSL. These laboratories maintain accreditations by the American Industrial Hygiene Association (AIHA), the National Voluntary Laboratory Accreditation Program (NVLAP), the California Department of Public Health Environmental Laboratory Accreditation Program (ELAP), and AIHA's Environmental Lead Laboratory Accreditation Program (ELLAP).

The results of the sample analyses are presented on the various Total Spore Surface Sample Results Tables. The photographs taken during each site visit are presented in Appendix I. The laboratory report is included in Appendix II.

## **FUNGI AND FUNGAL GROWTH**

Fungi are non-photosynthesising, ubiquitous (i.e. exist in all places), heterotrophic (i.e. they need to ingest nutrients), saprophytic (they eat dead material) organisms. They are either single celled (yeasts) or multicellular organisms that require specific environmental conditions to grow into the vegetative state from a fungal spore.

The fungal vegetative state includes the growth of certain structures, called reproductive structures. The reproductive structures of fungal growth include conidia, hyphae, and mycelium. These structures, represent, for lack of better terms, flower, stem, stalk, root, etc. The spores (i.e. seeds) grow on the conidia and, like seeds, are dispersed to spread the fungal species to new habitats. Therefore, there is a difference between the presence of fungal growth and finding culturable surface or airborne fungal spores.

Fungal growth on a surface indicates that the specific environmental conditions were met and that culturable (i.e. live) fungal spores were at the location. The collection of bulk, surface, and or settled dust samples, providing them with a nutrient media, and allowing the spores to culture (grow into the vegetative state) does not confirm that fungal growth occurred at the sampled location. It merely indicates that viable or culturable (i.e. live) fungal spores were at the location.

The presence of the structures of reproduction are the only true indicator that fungal growth occurred.

Air and surface samples can be collected for either total fungal spores (all spores, alive or dead) or culturable fungal spores (live spores). Total fungal spore air samples are collected typically using one of the many slit impaction samples currently available. The spores are collected onto a sticky surface through the slit. Total spore surface samples are typically collected using transparent tape, which is applied to the desired surface and then applied to a clear glass slide. The sampled surface is then analyzed microscopically to determine the quantity of fungal spores, identified in most cases to genus. The spores are not cultured, therefore, it is unknown whether they are culturable or dead. Culturable fungi air sampling is performed using a variety of devices to draw air across a container of nutrient media. The spores impact onto the media, where they are supplied nutrients and allowed to grow into the vegetative state. Dead fungal spores will not germinate; therefore, they are not counted as part of this analysis. Once the spores have been provided conditions to germinate (i.e. time, temperature, etc.) they are microscopically analyzed and identified, in many cases to species.

The collection of culturable and total fungal samples provides the trained professional different pieces of information related to the sampled environment. The interpretation of the information is the only method available to determine the conditions of the sampled environment. Air sampling is generally considered by the profession as a determiner of presumptive evidence of fungal contamination. Since air sampling cannot identify the presence of fungal growth on surfaces and since there are many sources of fungal spores (i.e. dust, dirt, etc.), air sampling can provide both false positive and false negative results associated with fungal growth. Therefore, surface or bulk sampling is necessary to identify actual fungal growth on surfaces.

The specific environmental conditions for fungal growth to occur are as follows. All of these conditions must be met prior to the germination of the fungal spore into the vegetative state.

- There must be nutrients for the fungal spores to eat. Fungal spores like cellulose, dirt, or any other dead organic material that they can digest.

In our environment there are plentiful amounts of dead organic material for fungi to eat.

- There must be culturable fungal spores at the location.

This condition is easily met since fungal spores are ubiquitous.

- Fungal spores require oxygen.

Oxygen is plentiful in our atmosphere.

- Fungal spores prefer dark places in which to grow, similar to the shadowy places where mushrooms grow.

Wall cavities and unventilated spaces are primary places where fungal growth occurs.

- Fungal spores require water or high levels of relative humidity (i.e. 65 to 70 percent) to grow into the vegetative state.



In some southeastern or Gulf of Mexico states, there is enough natural ambient relative humidity to cause fungal spores to grow into the vegetate state. However, the normal ambient relative humidity levels in the Southern California environment are generally not high enough to cause fungal spores to grow into the vegetative state. Therefore, water or humidity must be provided from a source other than nature.

Moisture and/or water intrusion into a building is the only environmental factor that is under the control of humans. All other factors are consistently present in our normal environment.

As discussed, fungal growth only occurs when there is sufficient moisture in the environment and moisture can have many origins. These include, but are not limited to, leaks, pipe bursts, sewage back-up events, floods, and elevated relative humidity. In addition, fungal growth is heaviest at the source of water intrusion and decreases with distance away from the origin.

An example of this is a crack in the exterior wall of a building adjacent to a sprinkler. Sprinkler water then routinely enters the building through the crack and saturates the porous, cellulose based wallboard in the building. Fungal growth then occurs on the wall cavity side of the board and can extend into the building with fungal growth beginning to occur in the space between the board and the base coving. In this instance the fungal growth would be heaviest on the cavity side of the wallboard and lighter on the room side.

Conversely, if the moisture source is elevated relative humidity from within the building, the concentration of fungal growth will be heaviest on the room side of the material and may be non-existent in the cavity of the material. In this instance, fungal growth can also occur on non-cellulose based materials such as plasters (which are primarily mineral based), windows (i.e. glass panes), fabrics (natural and synthetic), metal (i.e. aluminum window frames), etc., where there is no other food source other than the natural dust deposited on these surfaces.

Specific fungal genera/species are known to produce toxins. These genera/species include, but may not be limited to *Stachybotrys chartarum* (atra), *Aspergillus versicolor*, *Aspergillus flavus*, *Aspergillus fumigatus*, and *Fusarium* sp.. Recently, there has been significant attention spent by the media on the potential human health effects of these toxins. While there is significant evidence to confirm that exposure to significant amounts of toxins, primarily via ingestion or airborne exposure related to specific industrial occupations (i.e. agriculture, animal handling, etc.) can produce toxicosis and disease, recent articles have identified that exposure to indoor air concentrations of spores will not produce such effect in humans. The Morbidity and Mortality Weekly Report<sup>1</sup>, a publication of the Centers for Disease Control, states . . . “pulmonary hemorrhage/hemosiderosis in infants in Cleveland and household water damage or exposure to *S. chartarum* are not substantiated adequately by the scientific evidence produced in the CDC investigation (2-4). Serious shortcomings in the collection, analysis, and reporting of data resulted in inflated measures of association and restricted interpretation of the reports. The associations should be considered not proven; the etiology of AIPH is unresolved”. In short, the CDC now states that they have no substantive evidence to conclude that *S. chartarum* caused the Cleveland baby case.

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<sup>1</sup>Morbidity and Mortality Weekly Report, March 10, 2000 / 49(09);180-4,  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4909a3.htm>.

In addition, Page and Trout<sup>2</sup> have concluded that while there exists anecdotal evidence between fungal growth, mycotoxin production by fungi, and suspected health effects, . . . “there is inadequate evidence to support the conclusion that exposures to mycotoxins in the indoor (nonindustrial) environment is causally related to symptoms or illness among building occupants.”

An Evidence-Based Statement issued on October 27, 2002 by the American College of Occupational and Environmental Medicine (ACOEM) states “Some molds that propagate indoors may, under some conditions, produce mycotoxins that can adversely affect living cells and organisms by a variety of mechanisms. Adverse effects of molds and mycotoxins have been recognized for centuries following ingestion of contaminated foods. Occupational diseases are also recognized in association with inhalation exposure to fungi, bacteria, and other organic matter, usually in industrial or agricultural settings. Molds growing indoors are believed by some to cause building-related symptoms. Despite voluminous literature on the subject, the causal association remains weak and unproven, particularly with respect to causation by mycotoxins. One mold in particular, *Stachybotrys chartarum*, is blamed for a diverse array of maladies when it is found indoors. Despite its well-known ability to produce mycotoxins under appropriate growth conditions, years of intensive study have failed to establish exposure to *S. chartarum* in home, school, or office environments as a cause of adverse human health effects. Levels of exposure in the indoor environment, dose-response data in animals, and dose-rate considerations suggest that delivery by the inhalation route of a toxic dose of mycotoxins in the indoor environment is highly unlikely at best, even for the hypothetically most vulnerable sub-populations.”<sup>3</sup>

In their Evidence-based Statement the ACOEM concurs with the concept that when fungal growth is identified in indoor environments, the source of the moisture that caused the fungal growth to occur should be identified and corrected and that the colonized building materials should be removed.

## **HEALTH RISKS**

There are four primary health risks associated with fungal exposures. They are allergic reactions, irritation, toxicosis, and pathogens (i.e. cause disease). Each of these is discussed in the following sections.

### **Pathogens**

Many fungi are potential pathogens; however, they are considered to be opportunistic diseases that only affect those with an extremely weakened immune system (i.e. AIDS, TB, or transplant patients). They can also affect the very young or very old, whose immune systems are either building or declining, depending upon the time of life. Examples of opportunistic fungal

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<sup>2</sup>The Role of Stachybotrys Mycotoxins in Building-Related Illness, E. Page and D. Trout, AIHAJ, 62:644-648 (2001).

<sup>3</sup>Adverse Health Effects Associated with Molds in the Indoor air, Bryan D. Hardin, et. al., American College of Occupational and Environmental Medicine, Evidence-based Statement, October 27, 2002, <http://www.acoem.org/guidelines/article.asp?ID=52>.

diseases include thrush (caused by *Candidus albicans*) and aspergillosis (caused by several species of the genera *Aspergillus* sp., especially *A. fumigatus*).

The average healthy person has no reason to be concerned related to potential fungal diseases. Even with our aging population, fungal diseases are still very rare, unless you suffer from AIDS.

## **Toxicosis**

Toxicosis is defined as the build-up of toxins in the body. Based on the peer reviewed literature, there is no direct evidence that links low level exposure to fungal spores with toxic health risks. There is only a casual linkage of mold presence and health effects (i.e. I have health effects and my house has mold) without confirmation of route of exposure. Additionally, we are all familiar with fungal toxins. They are known as penicillin, cipro, and other commercially available antibiotics.

Toxicosis has been diagnosed in persons with extremely high fungal airborne exposure levels, such as in the occupational agricultural industry where workers may enter a grain silo and are potentially exposed to millions of spores per cubic meter of air, rather than thousands. Toxicosis can also occur by ingestion, eating or drinking contaminated food supplies. However, again, large quantities must be ingested to cause toxicosis.

The genesis of the current fear associated with exposure to “toxic mold” is related to the Cleveland Baby case. During the period of the early to mid 1990s there were two incidents where up to 21 babies who were diagnosed with pulmonary hemorrhage/hemosiderosis (i.e. bleeding lung disease). In the original case (1993-1994) 10 cases were identified and in the second case (1995-1996) 11 more cases were diagnosed in a small geographical suburb area of Cleveland. In total, three deaths occurred, one in the original case and two in the second.

Investigations originally led to identifying the causative agent to be toxins created by the fungi *Stachybotrys chartarum*. However, follow-up review of the data by internal and external committees have determined that the case has not been proven (published in March 2000). The change in the diagnosis was related to a variety of issues, which included that there was improper sample collection (i.e. pounding on the HVAC ductwork and furniture in the case houses and not in the control houses) and that the statistical review of the data was skewed.

Therefore, the literature and current research only supports that extremely high exposures to spores, whether via air or ingestion, are of concern.

## **Irritation**

Like humans, fungi produce volatile organic compounds (VOCs) when they are actively growing and digesting organic matter. Unlike humans, fungi do not have the social sensitivity to not release these compounds in the presence of others (i.e. flatulence). These odors produce the smell that we humans associate with mildew and produce the reaction of “it smells”. These VOCs have an extremely low odor threshold and are not generally considered to be a health risk. In addition, there is generally no known long term health risks associated with these odors.

## **Allergic Reactions**

The percentage of population that is allergic to fungal spores is estimated to be between 10 to 20 percent. It is difficult to predict who is going to be allergic since allergies are based on the biological and genetic make-up of each person and each person reacts differently or not at all.

The allergic reaction is the immune reaction gone awry where the system treats a non-pathogen as a pathogen. The response is generally to open mast cells that release histamines, which are intended to cause inflammation to keep the pathogen in a small area of the body. This is why we take an anti-histamine to counteract these effects.

The allergic reaction can be as simple as a runny nose or as severe as hypersensitivity pneumonitis (an extreme flu-like disease) or anaphylactic shock (i.e. as from bee stings). Both hypersensitivity pneumonitis and anaphylactic shock are very rare forms of the allergic reactions, which can cause severe disease and death. Fortunately, their occurrence remains extremely rare in our society.

Additionally, simply because there is an allergic reaction in a space with mold growth present, that does not implicate the mold as the causative agent. The number of agents, or antigens, which can cause an allergic response in our environment are innumerable.

## **STANDARDS AND GUIDELINES**

Standards and guidelines are often used as a reference point to assess safety. For airborne contaminants, concentrations measured are compared with federal or state regulatory standards and/or professionally recommended values.

For occupational exposures, reference values are published by the American Conference of Governmental Industrial Hygienists (ACGIH) and regulatory standards are set by both federal and state Occupational Safety and Health Administrations, OSHA and Cal/OSHA.

Both regulatory standards and ACGIH guidelines are designed to protect workers from exposure to unhealthful concentrations of airborne substances. However, the levels established by these bodies may not necessarily eliminate all effects for all people, e.g., mild irritations, response to odors, unique sensitivity.

### **Regulatory or Professional Organizations for Bioaerosol Exposure**

Currently, there are no regulatory standards promulgated by any governmental agency with respect to levels of microbiological organisms or bioaerosols in public or private buildings.

Based on health hazard evaluations conducted by the National Institute of Occupational Safety and Health (NIOSH), Morey, et. al.<sup>4</sup> it was suggested in 1984 that a "level of viable

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<sup>4</sup> Morey, P. R., Hodgson, M. J., Sorenson, W. G., Kullman, G. H., Rhodes, W. W., and G. S. Visvesvara. 1984. Environmental studies in moldy office buildings: biological agents, sources and preventive measures. Ann Am. Conf. Gov, Ind, Hyg. 10:21-35

microorganisms in excess of  $1 \times 10^3$  CFUs/m<sup>3</sup> indicates that the indoor environment may be in need of investigation and improvement”.

In 1986 the ACGIH Committee on Bioaerosols<sup>5</sup> proposed that "total counts exceeding 10,000 CFUS/m<sup>3</sup> indicate a need to proceed to remedial actions." However, the 1989 ACGIH Guidelines for the Assessment of Bioaerosols in the Indoor Environment<sup>6</sup> now recommend the use of rank-order comparisons of indoor and outdoor air sample populations, rather than specifying threshold concentrations that require remediation. The ACGIH and others also recommend that if air samples are collected, the scope of work should include multiple rounds of indoor and outdoor air samples to attempt to identify the natural variation of spore concentrations in both the indoor and outdoor air.

### **Current Standard of Practice for Bioaerosols**

In lieu of promulgated regulatory or recommended guidelines, and as a result of the rapidly expanding knowledge concerning collection methods, professional Industrial Hygiene practitioners have begun to define and apply the following general approaches in assessing bioaerosols in the indoor environment.

To credibly conclude that there is or is not a fungal problem within a building, an investigator must carefully evaluate the fungal content of the outdoor environment surrounding the building. Fungal concentrations outdoors may range from 1,000-100,000 CFUS/m<sup>3</sup> and influence indoor conditions via infiltration and mechanical intake of outdoor air<sup>7</sup>. As a general rule, indoor fungal problems are usually indicated when a significant difference is demonstrated between indoor and outdoor airborne spore concentrations or types of spore genera or species.

It has been established that airborne spore concentrations collected and analyzed according to standard "viable" techniques, underestimate the total number of spores that are potentially present. Burge, et al.<sup>8</sup>, demonstrated that as spore levels rose, culture plate data progressively underestimated prevailing concentrations with recoveries falling below 5% at airborne levels above 500 spores/m<sup>3</sup>. Collection and analysis of total airborne spores (in addition to viable spores) is now considered essential in evaluating potential fungal magnification.

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<sup>5</sup> Morey, P. R., Otten, J., Burge, H. A., Chatigny, M., Feeley, J., LaForce, F. M., and K. Peterson. 1986. Airborne viable microorganisms in office environments: sampling protocol and analytical procedures (Draft Report). Appl. Ind. Hyg. I:R19-R23

<sup>6</sup> Burge, H. A., Kreiss, K., Morey, P. R., Otten, J., Peterson, K., Chatigny, M., and J. Freeley. 1987. Guidelines for assessment and sampling of saprophytic bioaerosols in the indoor environment. Appl. Ind. Hyg, 2 (5):R10-R16

<sup>7</sup> American Conference of Governmental Industrial Hygienists. 1989. Guidelines for the assessment of bioaerosols in the indoor environment, American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio.

<sup>8</sup> Burge, H. A., Boise J. R., Rutherford, J. A., and W. R. Solomon 1977. Comparative recoveries of airborne fungus spores by viable and non-viable modes of volumetric collection. Mycopathologia 61: 27-33.

In 1993, Buttner and Stetzenbach<sup>9</sup> established that air sampling without concomitant surface sampling may not adequately reflect the level of microbial contamination in indoor environments. It is now recognized that surface samples should be collected to evaluate general levels of microorganisms present and to verify that fungal growth is found. In lieu of any promulgated regulatory or recommended guidelines for surface levels, professional Industrial Hygiene practitioners have defined a general surface level of under 50 spores per square millimeter (s/mm<sup>2</sup>) as a concentration that should not produce complaints or allergic reactions. If the surface levels are below 10 s/mm<sup>2</sup>, then the building is considered to be clean.

## **RESULTS AND OBSERVATIONS**

The analytical results of the total spore surface samples that were collected during this site visit are included on Table I. In summary, fungal growth or elevated levels of spores were found at almost all sampled locations. Listed below are the locations where fungal growth was found to be present based on the lab results, bolded items. The non-bolded locations are areas where elevated levels of spores were found, no identified growth structures. The picture number of the sampling locations is also included in parentheses. Not surprising, the kitchen ceiling and the exercise room northeast side area were determined to have active fungal growth.

1. Cupola, from 2 x 6 beam above cat walk at east wall (004).
2. Cupola, from louver of west vent (012).
3. Cupola, from dark spotty debris at east wall at vent (014 and 015).
4. **Attic Kitchen, suspect visible mold (057).**
5. From blanked off attic duct (059).
6. **Kitchen, suspect mold on ceiling (097).**
7. **Kitchen, suspect mold on ceiling (099).**
8. Exercise Room at return (106).
9. Exercise Room at supply (107).
10. **Exercise room from possible visible mold at northeast side (168).**

As far as the crawlspace is concerned, there was no visible growth in the inspected areas.

Additionally, there was one area where boroscope investigation identified the presence of suspect visible fungal growth inside of a wall cavity. This was located in Room 3, north wall. Therefore, this area needs to be added to the further investigation and potentially remediation scope of work.

As previously identified, there was an extremely heavy layer of dust and dirt throughout the facility. The areas of the station with elevated levels of settled dust include the various rooms previously noted and the cupola (see pictures numbers 1-35, 11/29/17 site visit). The elevated levels of dust in the area were also evident when inspecting the filters that were installed in the wall mounted air condition units. The dust level that is present on the filters is visible in pictures

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<sup>9</sup> Buttner, M. P., and Stetzenbach, L. D., 1993. Monitoring airborne fungal spores in and experimental indoor environment to evaluate sampling methods and the effects of human activity on air sampling. Applied and Environmental Microbiology 59:219-226

72-74 (11/29/17 site visit), which were taken from the wall mounted AC unit in room #3, indicating that the filters have not been changed in an extended period of time.

There is at least one additional issue related to the HVAC system of the station, which is the blanked-off return ductwork line that is present in the second floor attic space and mechanical area (picture 32 from the 10/23/17 job walk). Therefore, this return ductwork line may or may not be a part of the operation of the overall HVAC system for the station and could indicate that the system is not operating properly, which could be related to some of the IAQ issues being experienced in the station.

As part of the October 23, 2017 job walk, it was identified that there was a hole in one of the engine exhaust vents for the station. This was verbally communicated at the time of the meeting (see picture 81- 10/23/17). The hole in the exhaust ductwork was still present during the November 29, 20-17 site visit (see picture 186).

## **RECOMMENDATIONS**

The following are HSA's recommendations for this station.

1. The entire station, including the cupola, should be thoroughly cleaned. This should be performed following the deep cleaning protocol prepared by HSA (See Appendix III).
2. An evaluation of the entire HVAC system should be performed by an HVAC engineer to determine how the system is operating and if the blanked-off return ductwork line in the attic mechanical area has in any way compromised the system.
3. The engine exhaust vent in the garage area needs to be repaired.
4. The maintenance schedule related to the wall mounted AC units needs to be evaluated. Maintenance, including filter replacements should be performed pursuant to the requirements of the manufacturer.
5. Fungal remediation in the following areas of the station needs to be performed following the fungal remediation protocol that is included in Appendix IV. The containments described in the remediation protocol are based on the medium sized areas of fungal growth pursuant to the New York Guidelines<sup>10</sup>.
  - a. The ceiling in the kitchen needs to have fungal remediation performed. The exact amount of ceiling that needs to be removed is approximately 40 square feet.
  - b. The northeast wall section of the exercise room needs to be remediated. While the amount of visible fungal growth that was present on the room side of the wall in this area appeared to be small (less than one square foot), the amount of growth that could be present in the wall cavity is unknown. Therefore, HSA recommends that as a conservative approach, it should be assumed that the amount of growth at this location requires a medium containment.

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<sup>10</sup><https://www1.nyc.gov/assets/doh/downloads/pdf/epi/epi-mold-guidelines.pdf>


- c. The north wall of room #3 needs to be further investigated and if fungal growth is present, then a remediation should be performed. If it is determined that an investigation should be performed first, then the remediation contractor who is performing the remediation in the kitchen and exercise rooms should perform this investigation using a glove bag to create a mini-containment and cut a 12 inch by 12 inch hole in the wall to determine whether the areas of visible suspect growth in this area are actually fungal growth or merely dust/dirt that appeared to be fungal growth through the boroscope.

If you have any questions regarding this report, please feel free to contact us at (714) 220-3922.

Performed

Reviewed By

  
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Kevin Burke





**TABLE I - TOTAL SPORE SURFACE SAMPLING RESULTS**

**Fire Station 9  
City of Long Beach  
3917 Long Beach Blvd  
Long Beach, CA**

**November 29, 2017**

Sample No.	Location (photograph #)	s/mm <sup>2</sup>	Spore Type (percentage)
T - 1	Cupola, from 2 x 6 beam above cat walk at east wall (004)	21	<i>Alternaria sp.</i> (8) - spores only <i>Ascospores</i> (4) - spores only <i>Basidiospores</i> (8) - spores only <i>Chaetomium sp.</i> (4) - spores only <i>Cladosporium sp.</i> (19) - spores only <i>Curvularia sp.</i> (4) - spores only <i>Hyaline spores</i> (42) - spores only <i>Myxomycete sp.</i> (12) - spores only
T - 2	Cupola, from louver of west vent (012)	14	<i>Basidiospores</i> (18) - spores only <i>Cladosporium sp.</i> (24) - spores only <i>Hyaline spores</i> (47) - spores only <i>Myxomycete sp.</i> (6) - spores only Unidentifiable Spores (6) - spores only
T - 3	Cupola, from dark spotty debris at east wall at vent (014 and 015)	25	<i>Ascospores</i> (10) - spores only <i>Basidiospores</i> (3) - spores only <i>Cladosporium sp.</i> (20) - spores only <i>Epicoccum sp.</i> (10) - spores only <i>Hyaline spores</i> (43) - spores only <i>Myxomycete sp.</i> (7) - spores only <i>Oidium sp.</i> (3) - spores only Unidentifiable Spores (3) - spores only
T - 4	Attic Kitchen, suspect visible mold (057)	10,288	<i>Chaetomium sp.</i> (34) - active fertile colony <i>Hyaline spores</i> (<1) - spores only <i>Memnoniella sp.</i> (65) - active fertile colony
T - 5	From blanked off attic duct (059)	67	<i>Alternaria sp.</i> (2) - spores only <i>Cladosporium sp.</i> (5) - spores only <i>Hyaline spores</i> (28) - spores only <i>Myxomycete sp.</i> (62) - spores only Unidentifiable Spores (2) - spores only
T - 6	Kitchen, suspect mold on ceiling (097)	4,019	<i>Chaetomium sp.</i> (98) - active fertile colony <i>Hyaline spores</i> (2) - spores only
T - 7	Kitchen, suspect mold on ceiling (099)	9,984	<i>Aspergillus sp.</i> (100) - active fertile colony
T - 8	Exercise Room at return (106)	25	<i>Basidiospores</i> (13) - spores only <i>Chaetomium sp.</i> (3) - spores only <i>Cladosporium sp.</i> (6) - spores only <i>Hyaline spores</i> (61) - spores only <i>Myxomycete sp.</i> (16) - spores only

**TABLE I - TOTAL SPORE SURFACE SAMPLING RESULTS continued**

**Fire Station 9  
City of Long Beach  
3917 Long Beach Blvd  
Long Beach, CA**

**November 29, 2017**

Sample No.	Location (photograph #)	s/mm <sup>2</sup>	Spore Type (percentage)
T - 9	Exercise Room at supply (107)	13	<i>Alternaria sp.</i> (6) - spores only Basidiospores (12) - spores only Hyaline spores (69) - spores only <i>Myxomycete sp.</i> (12) - spores only
T - 10	Movie Room from staining on north wall at Bedroom 1 (116 and 117)	2	Hyaline spores (100) - spores only
T - 11	Exercise room from possible visible mold at northeast side (168)	4,327	<i>Chaetomium sp.</i> (<1) - spores only Hyaline spores (7) - spores only <i>Stachybotrys sp.</i> (93) - active fertile colony
T - 12	Field Blank	0	None Detected
Analytical Method: EMSL: M170 (Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and other Particulates from Tape Samples)			
Professional Guidance		<10	No Toxigenic Spore Types
<b>Abbreviations:</b> s/mm <sup>2</sup> = spores per square millimeter; % - per cent			

## **APPENDIX I - PHOTOGRAPHS**

City of Long Beach-Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, CA

by Joel I. Berman

October 23, 2017



GEDC0001\_r



GEDC0002\_r



GEDC0003\_r



GEDC0004\_r



GEDC0005\_r



GEDC0006\_r



GEDC0007\_r



GEDC0008\_r



GEDC0009\_r



GEDC0010\_r

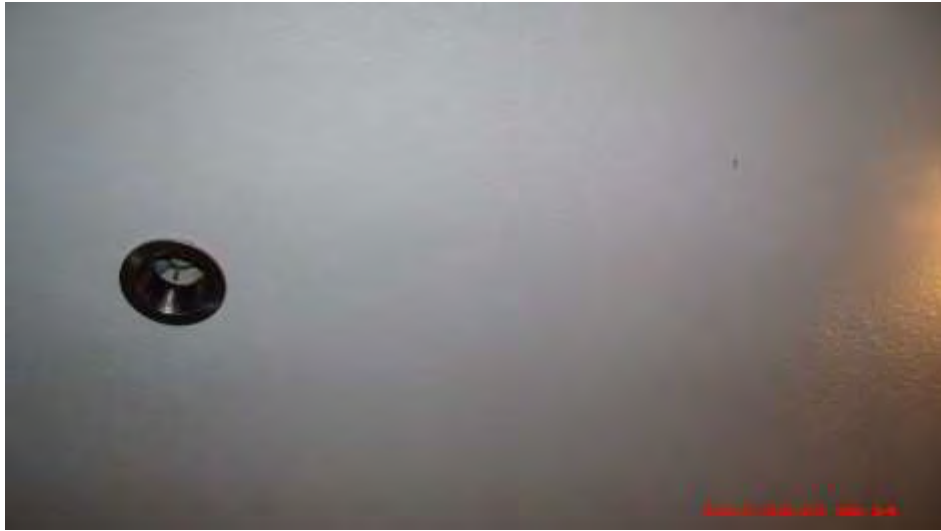


GEDC0011\_r



GEDC0012\_r





GEDC0013\_r



GEDC0014\_r



GEDC0015\_r



GEDC0016\_r





GEDC0017\_r



GEDC0018\_r



GEDC0019\_r



GEDC0020\_r



GEDC0021\_r



GEDC0022\_r



GEDC0023\_r



GEDC0024\_r





GEDC0025\_r



GEDC0026\_r



GEDC0027\_r



GEDC0028\_r



GEDC0029\_r



GEDC0030\_r



GEDC0031\_r



GEDC0032\_r



GEDC0033\_r



GEDC0034\_r



GEDC0035\_r



GEDC0036\_r





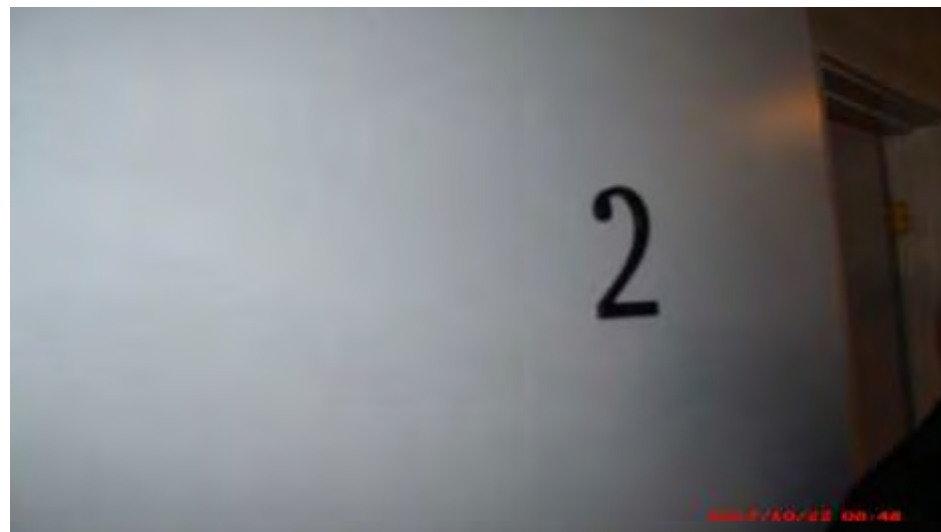
GEDC0037\_r



GEDC0038\_r



GEDC0039\_r



GEDC0040\_r



GEDC0041\_r



GEDC0042\_r



GEDC0043\_r



GEDC0044\_r



GEDC0045\_r



GEDC0046\_r



GEDC0047\_r



GEDC0048\_r





GEDC0049\_r



GEDC0050\_r



GEDC0051\_r



GEDC0052\_r



GEDC0053\_r



GEDC0054\_r



GEDC0055\_r



GEDC0056\_r



GEDC0057\_r



GEDC0058\_r



GEDC0059\_r



GEDC0060\_r





GEDC0061\_r



GEDC0062\_r



GEDC0063\_r



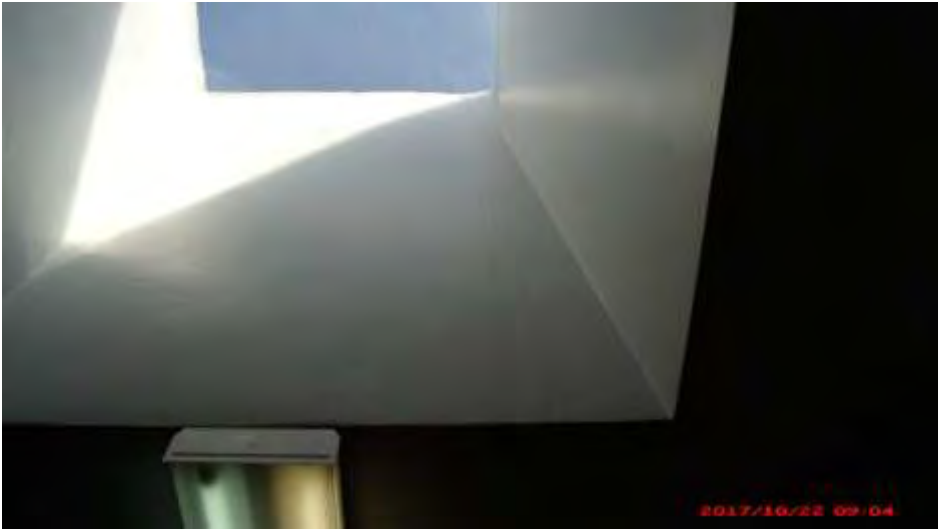
GEDC0064\_r



GEDC0065\_r



GEDC0066\_r



GEDC0067\_r



GEDC0068\_r



GEDC0069\_r



GEDC0070\_r



GEDC0071\_r



GEDC0072\_r

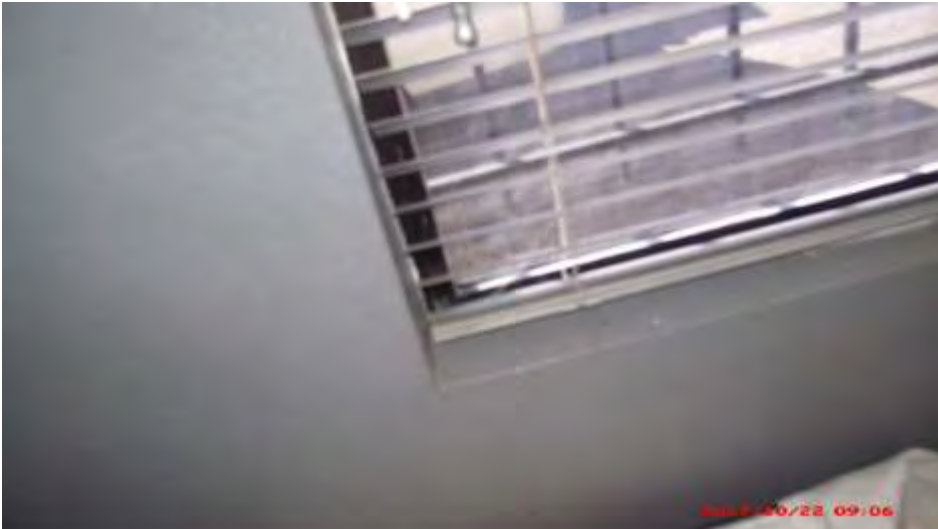




GEDC0073\_r



GEDC0074\_r



GEDC0075\_r



GEDC0076\_r





GEDC0077\_r



GEDC0078\_r



GEDC0079\_r



GEDC0080\_r



GEDC0081\_r



GEDC0082\_r



GEDC0083\_r



GEDC0084\_r



GEDC0085\_r



GEDC0086\_r



GEDC0087\_r

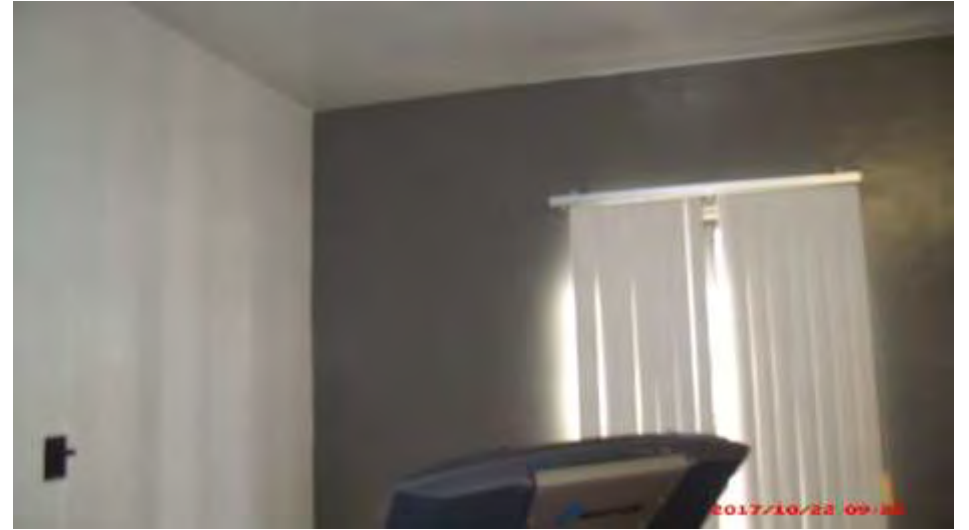


GEDC0088\_r





GEDC0089\_r



GEDC0090\_r



GEDC0091\_r



GEDC0092\_r



GEDC0093\_r



GEDC0094\_r



GEDC0095\_r



GEDC0096\_r



GEDC0097\_r



GEDC0098\_r



GEDC0099\_r



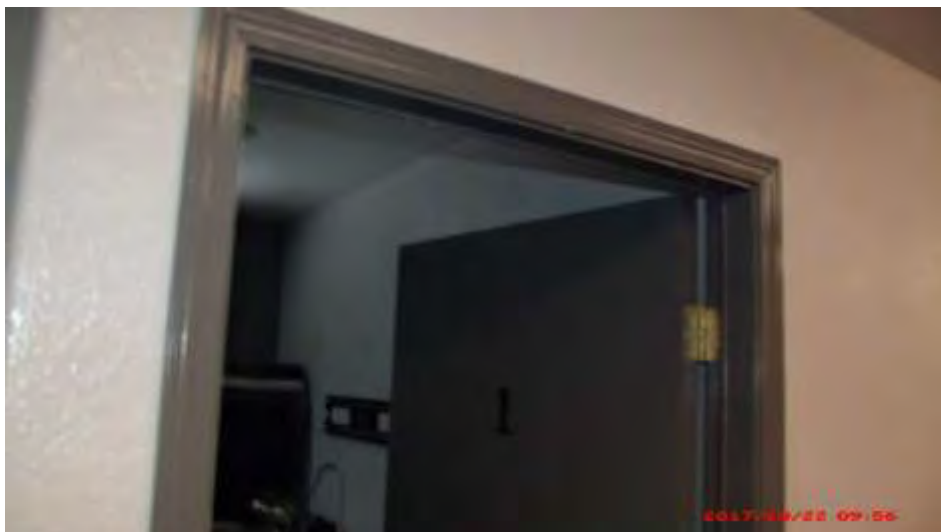
GEDC0100\_r



GEDC0101\_r



GEDC0102\_r



GEDC0103\_r



GEDC0104\_r





GEDC0105\_r



GEDC0106\_r



GEDC0107\_r

City of Long Beach-Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, CA

HSA Project Number 180034LA

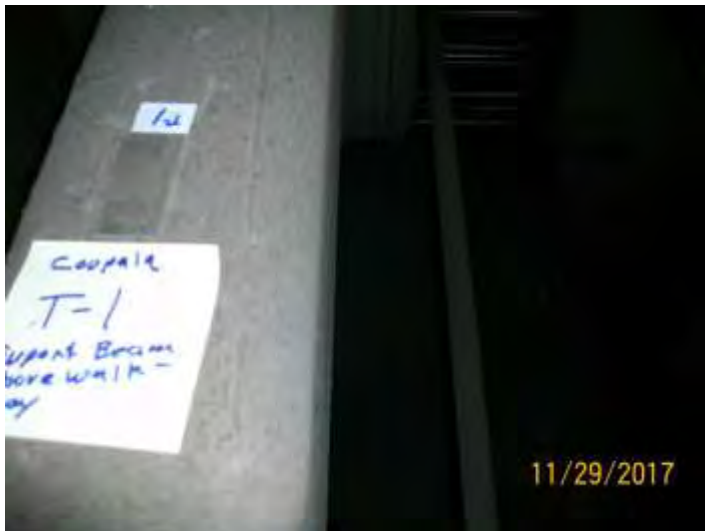
November 29, 2017



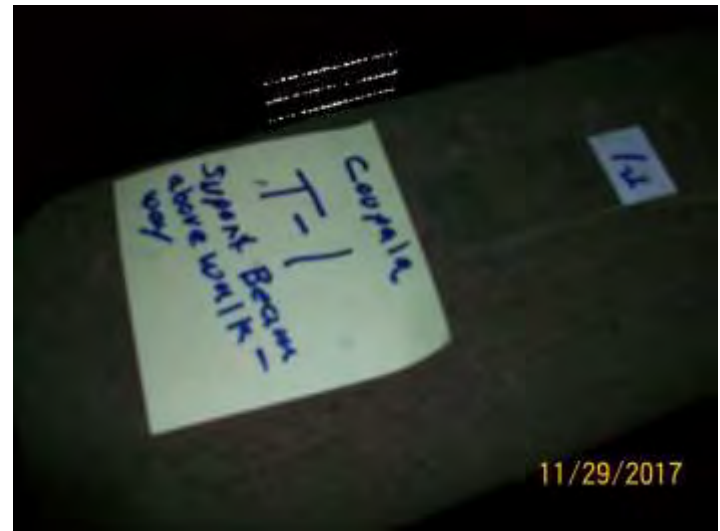
Pic 001\_r



Pic 002\_r



Pic 003\_r



Pic 004\_r



Pic 005\_r



Pic 006\_r



Pic 007\_r



Pic 008\_r



Pic 009\_r



Pic 010\_r



Pic 011\_r



Pic 012\_r





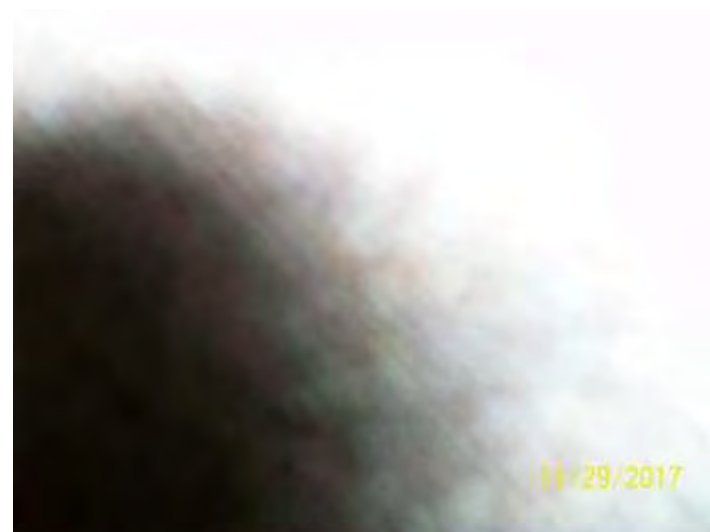
Pic 013\_r



Pic 014\_r



Pic 015\_r



Pic 016\_r



Pic 017\_r



Pic 018\_r



Pic 019\_r



Pic 020\_r





Pic 021\_r



Pic 022\_r



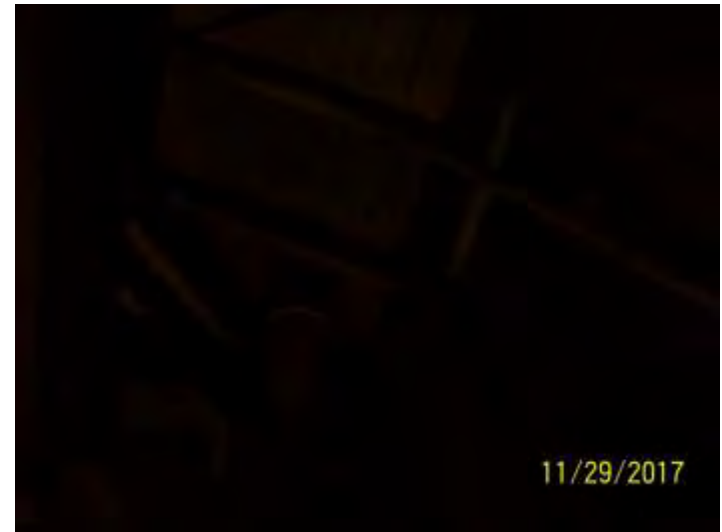
Pic 023\_r



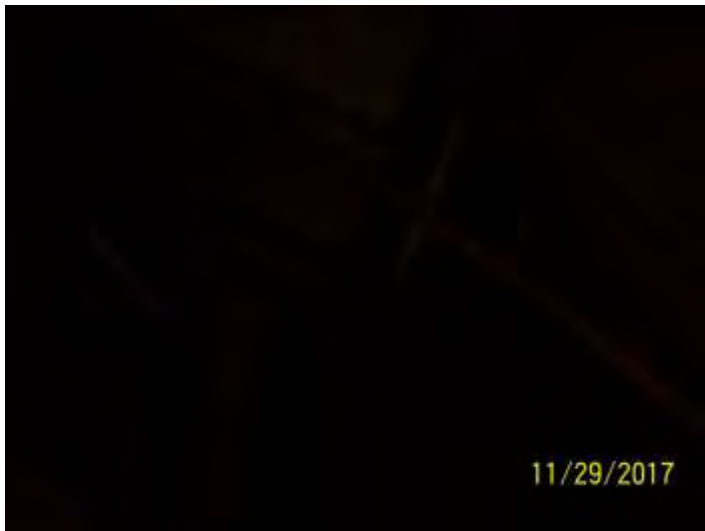
Pic 024\_r



Pic 025\_r



Pic 026\_r



Pic 027\_r



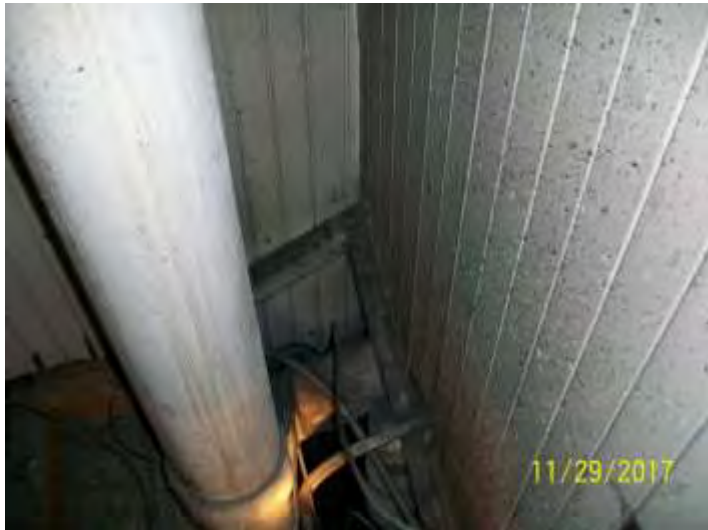
Pic 028\_r



Pic 029\_r



Pic 030\_r



Pic 031\_r



Pic 032\_r



Pic 033\_r



Pic 034\_r

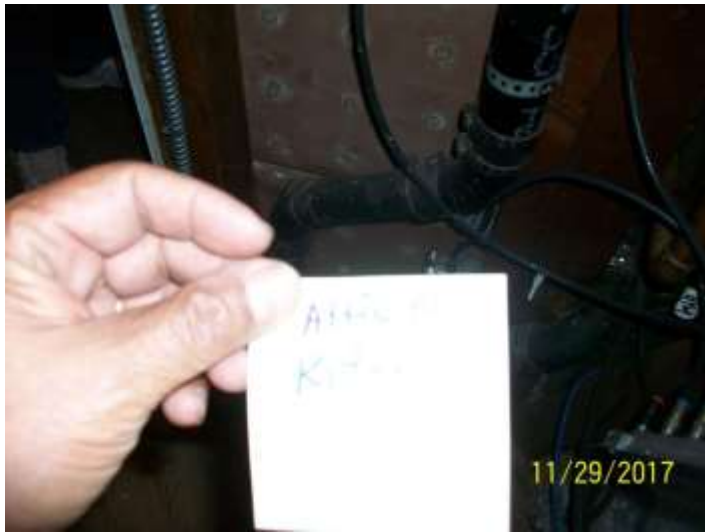


Pic 035\_r

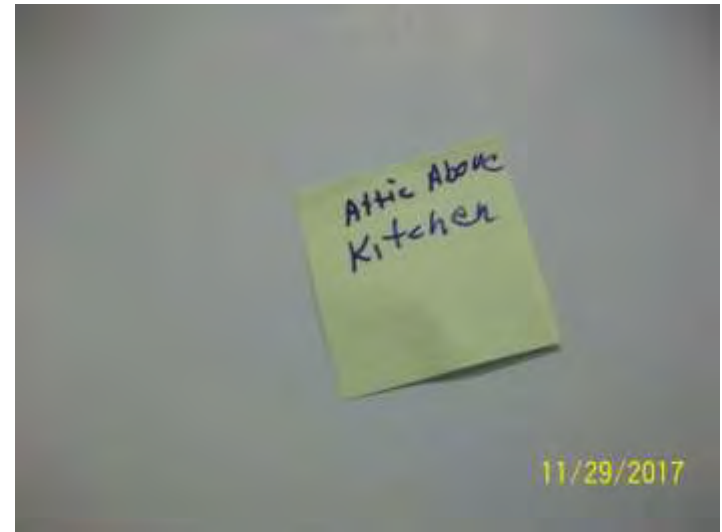


Pic 036\_r





Pic 037\_r



Pic 038\_r



Pic 039\_r



Pic 040\_r

Pic 043\_r



Pic 041\_r



Pic 044\_r



Pic 042\_r







Pic 045\_r



Pic 046\_r



Pic 047\_r



Pic 048\_r



Pic 049\_r



Pic 050\_r



Pic 051\_r



Pic 052\_r





Pic 053\_r



Pic 054\_r



Pic 055\_r



Pic 056\_r



Pic 057\_r



Pic 058\_r



Pic 059\_r



Pic 060\_r



Pic 061\_r



Pic 062\_r



Pic 063\_r



Pic 064\_r





Pic 065\_r



Pic 066\_r



Pic 067\_r

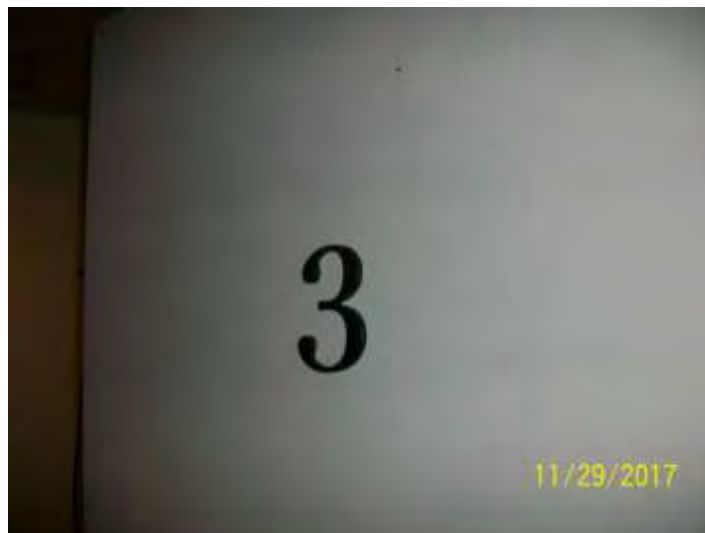


Pic 068\_r





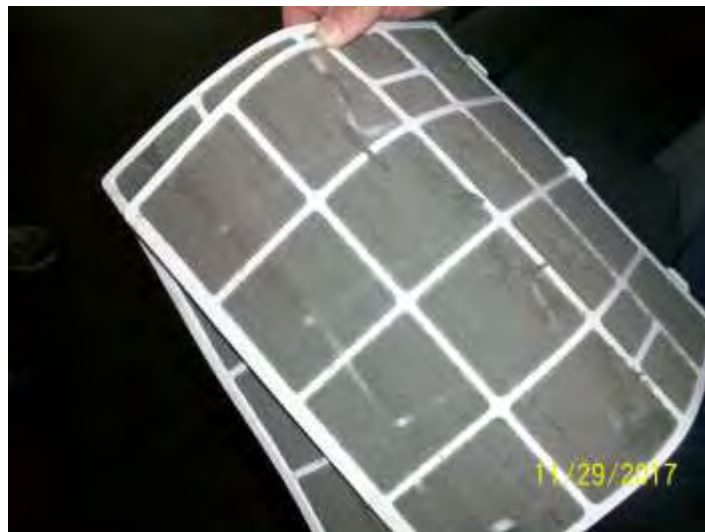
Pic 069\_r



Pic 070\_r

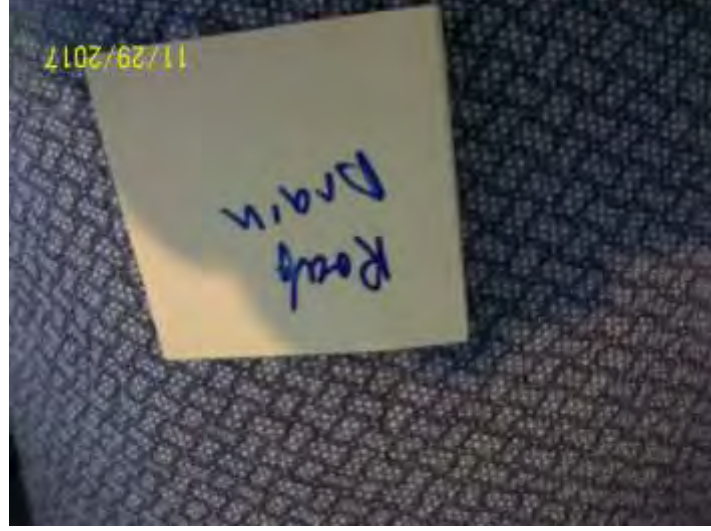


Pic 071\_r



Pic 072\_r

Pic 075\_r



Pic 073\_r



Pic 076\_r

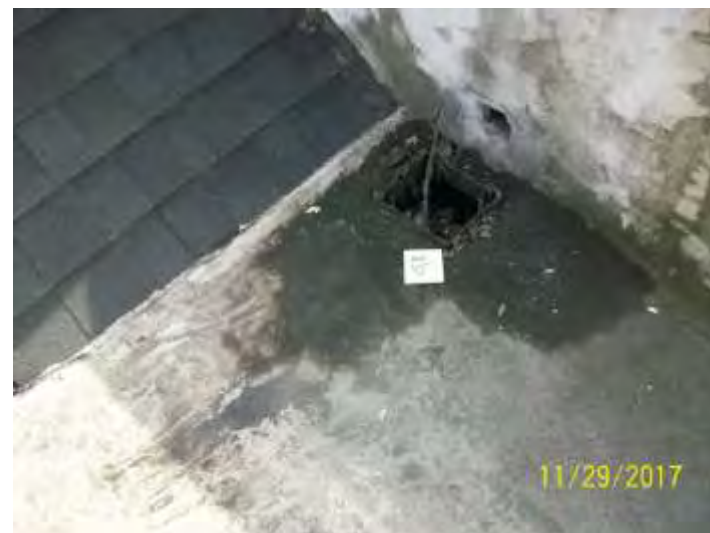


Pic 074\_r





Pic 077\_r



Pic 078\_r

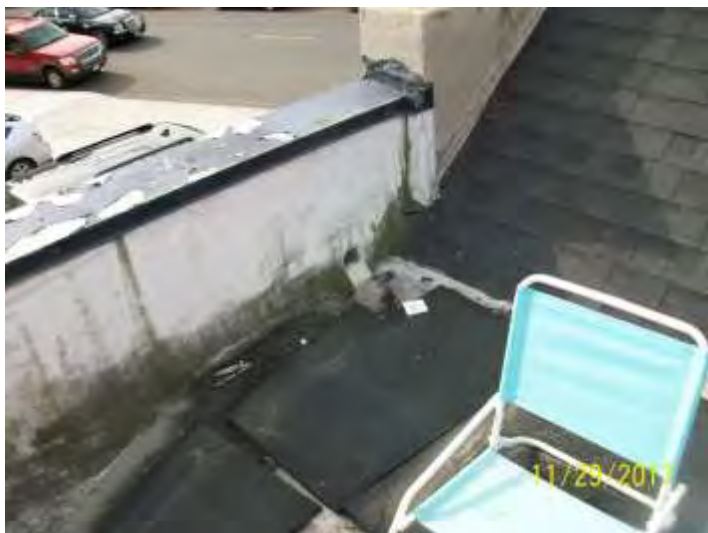


Pic 079\_r



Pic 080\_r





Pic 081\_r



Pic 082\_r



Pic 083\_r



Pic 084\_r



Pic 085\_r



Pic 086\_r



Pic 087\_r



Pic 088\_r



Pic 089\_r



Pic 090\_r



Pic 091\_r



Pic 092\_r





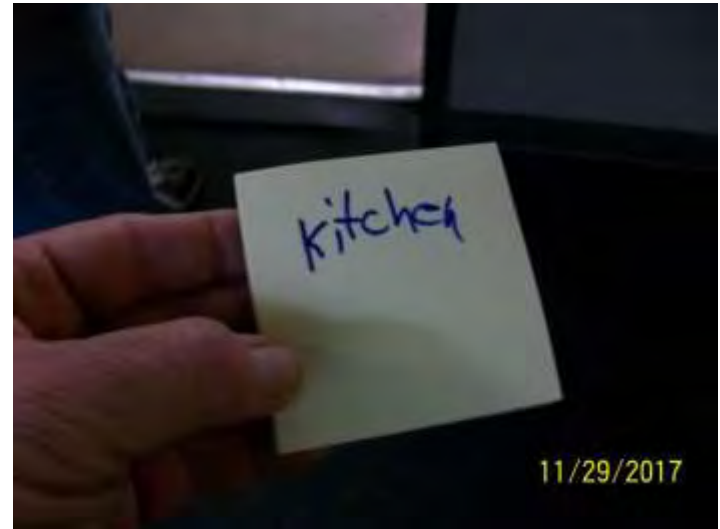
Pic 093\_r



Pic 094\_r



Pic 095\_r



Pic 096\_r



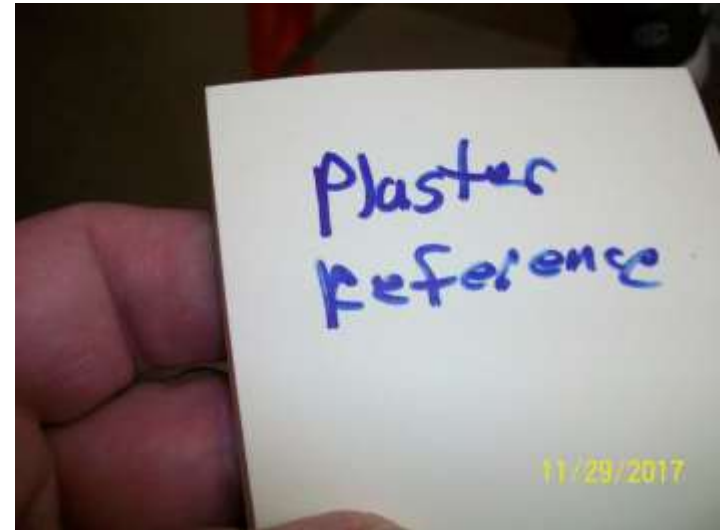
Pic 097\_r



Pic 098\_r



Pic 099\_r



Pic 100\_r



Pic 101\_r



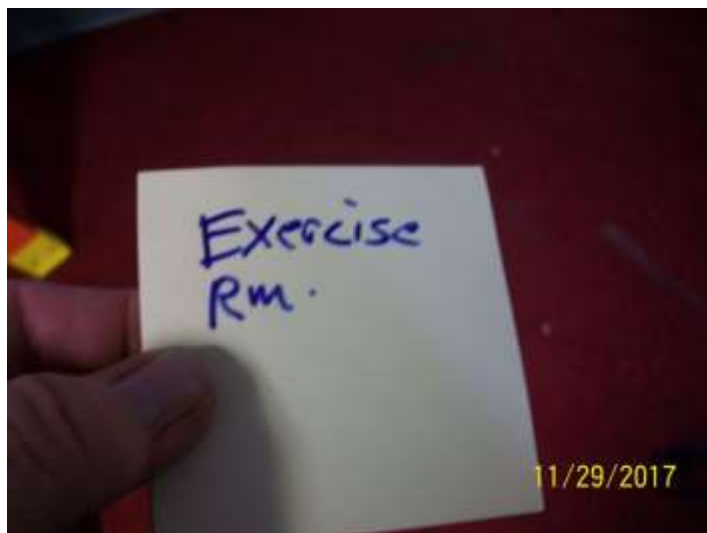
Pic 102\_r



Pic 103\_r



Pic 104\_r



Pic 105\_r



Pic 106\_r



Pic 107\_r



Pic 108\_r





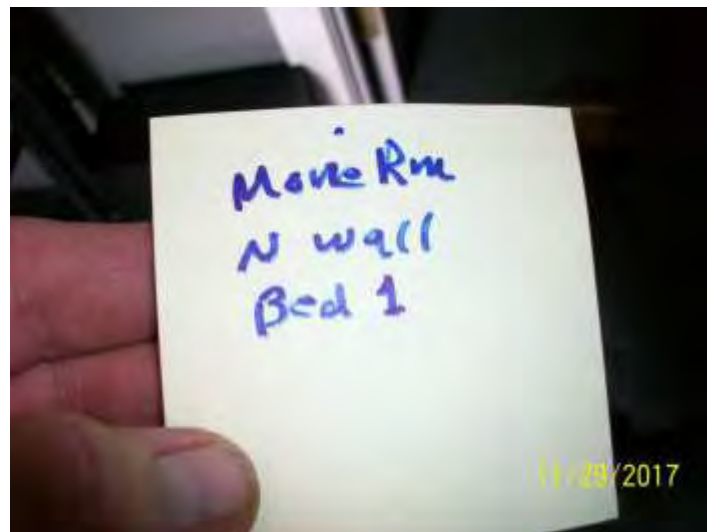
Pic 109\_r



Pic 110\_r



Pic 111\_r



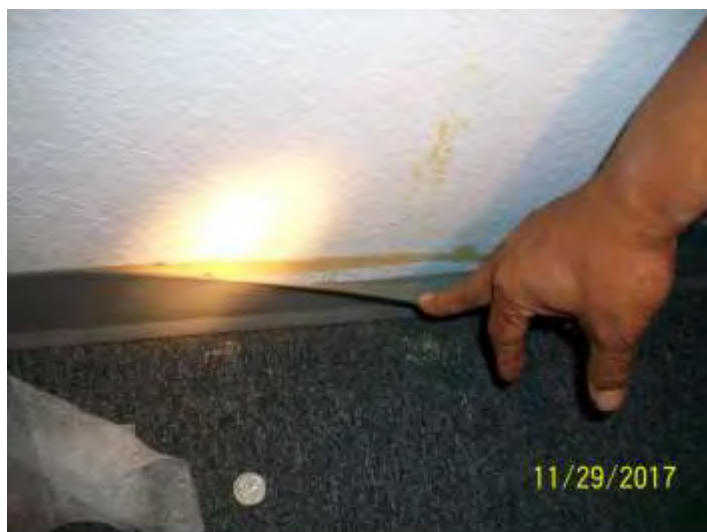
Pic 112\_r



Pic 113\_r



Pic 114\_r



Pic 115\_r

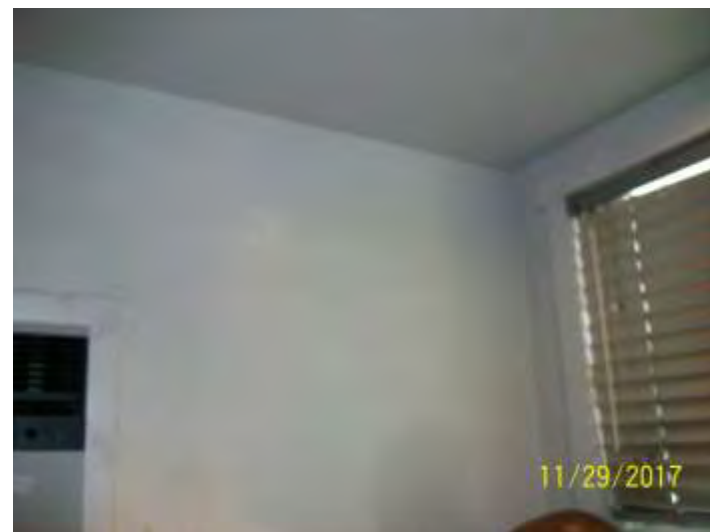


Pic 116\_r





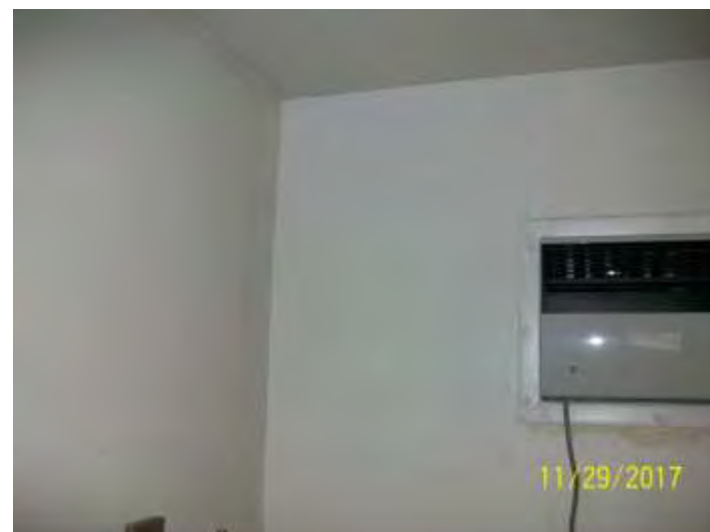
Pic 117\_r



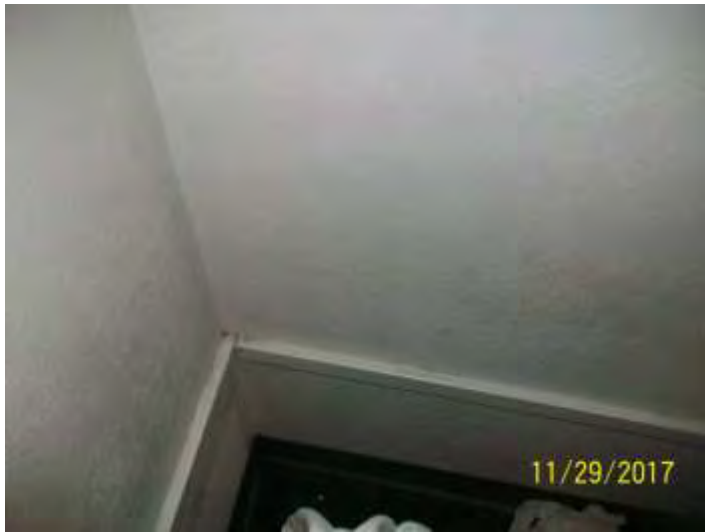
Pic 118\_r



Pic 119\_r



Pic 120\_r



Pic 121\_r



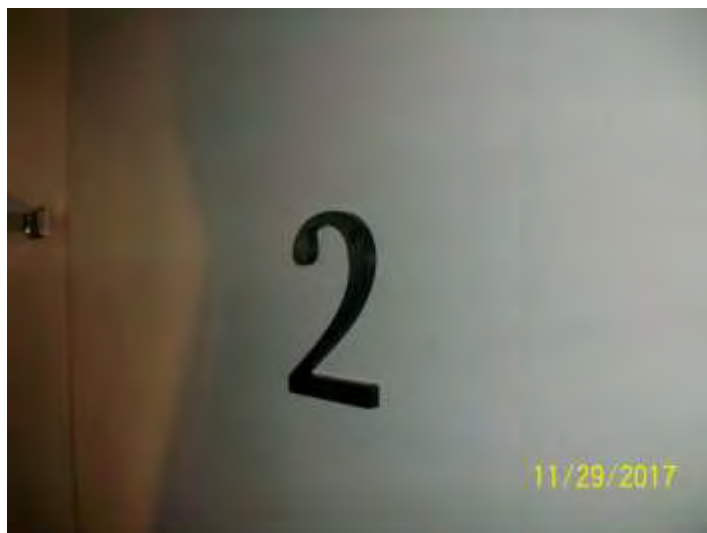
Pic 122\_r



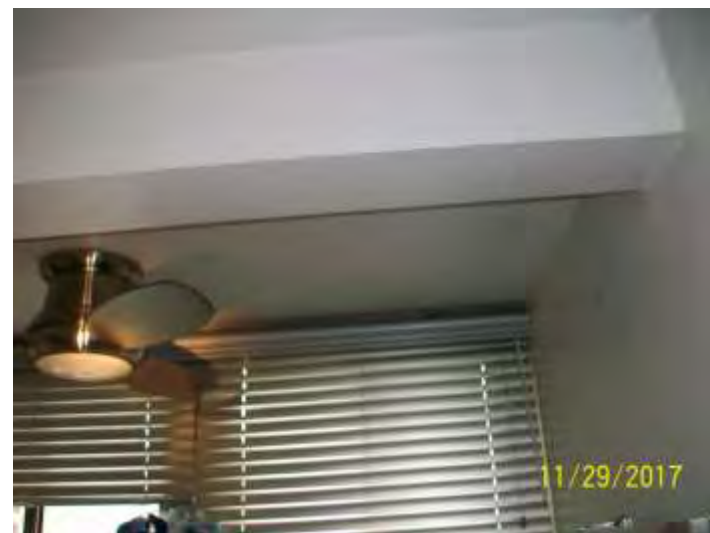
Pic 123\_r



Pic 124\_r



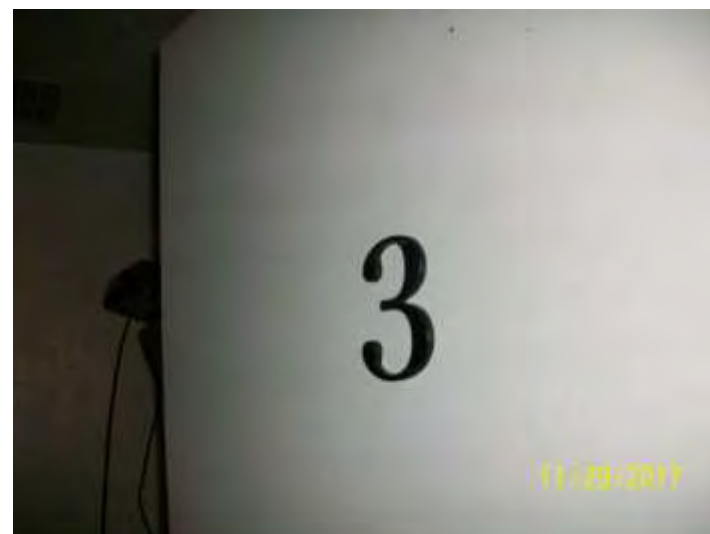
Pic 125\_r



Pic 126\_r



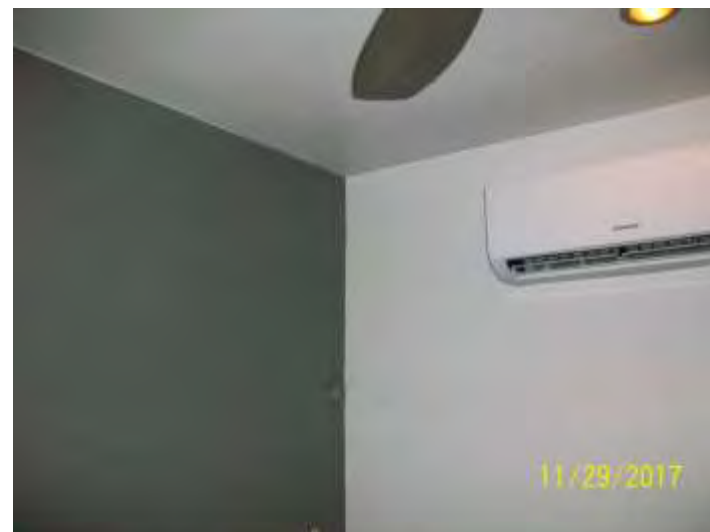
Pic 127\_r



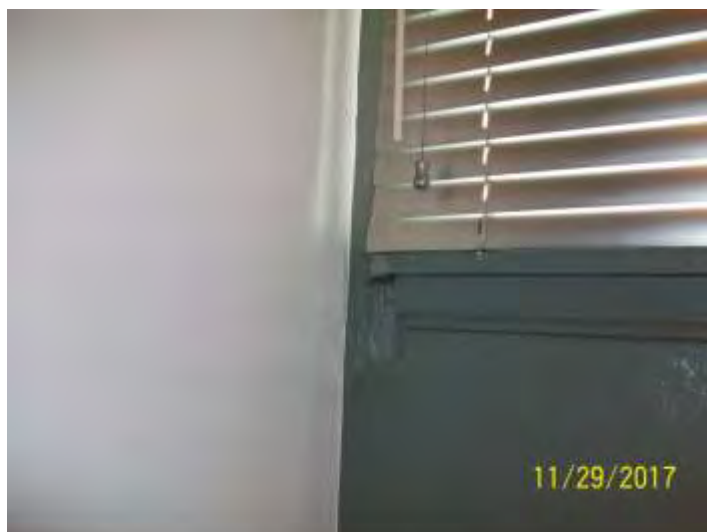
Pic 128\_r



Pic 129\_r



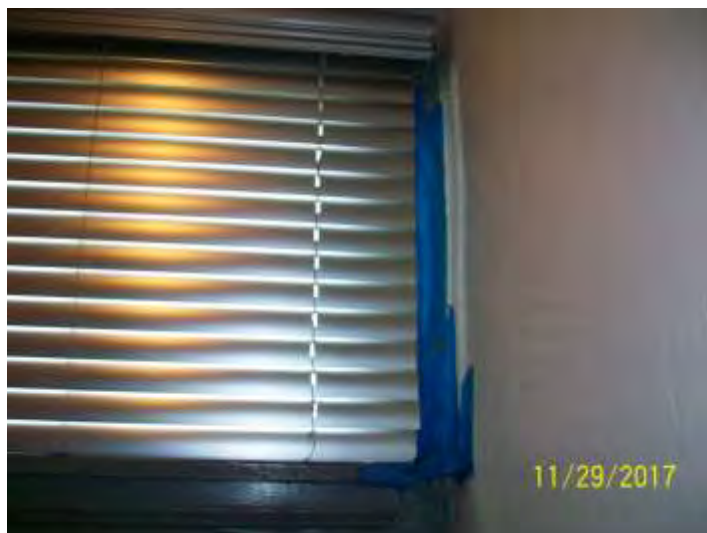
Pic 130\_r



Pic 131\_r



Pic 132\_r



Pic 133\_r



Pic 134\_r



Pic 135\_r

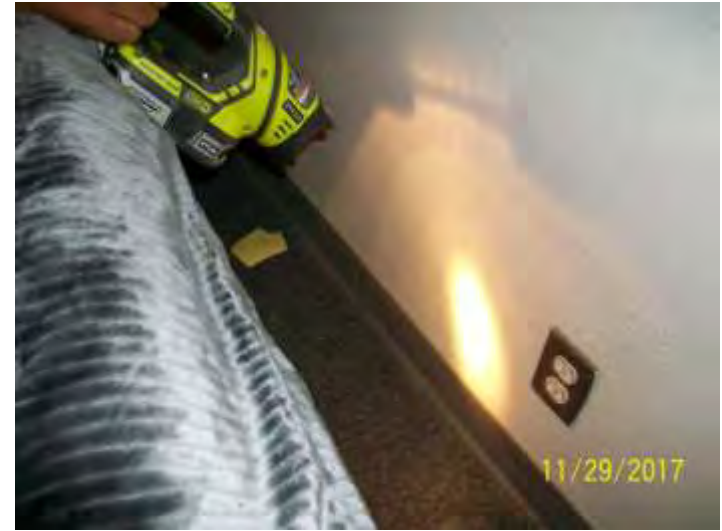


Pic 136\_r

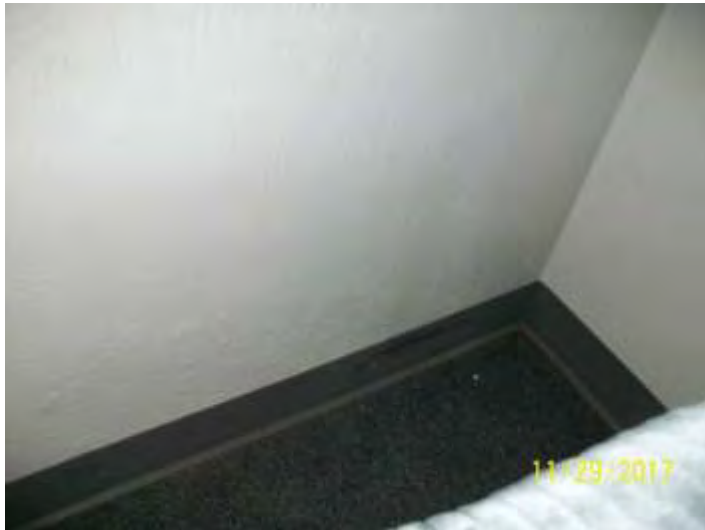




Pic 137\_r



Pic 138\_r



Pic 139\_r



Pic 140\_r





Pic 141\_r



Pic 142\_r



Pic 143\_r



Pic 144\_r

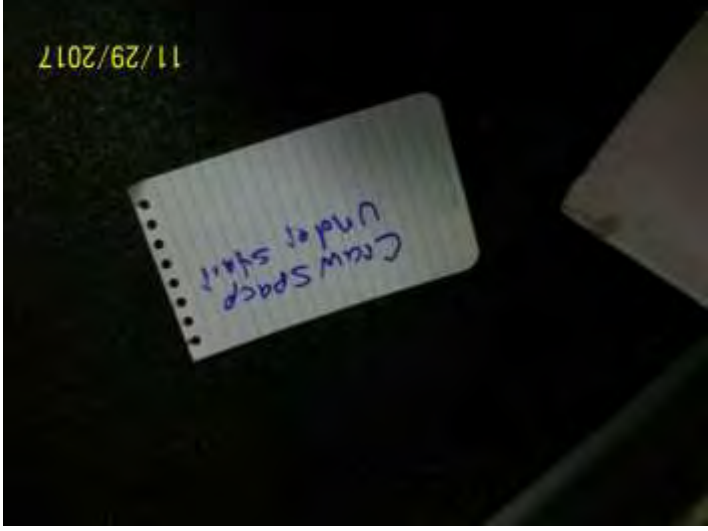
Pic 147\_r



Pic 145\_r



Pic 148\_r



Pic 146\_r





Pic 149\_r



Pic 150\_r



Pic 151\_r



Pic 152\_r



Pic 155\_r



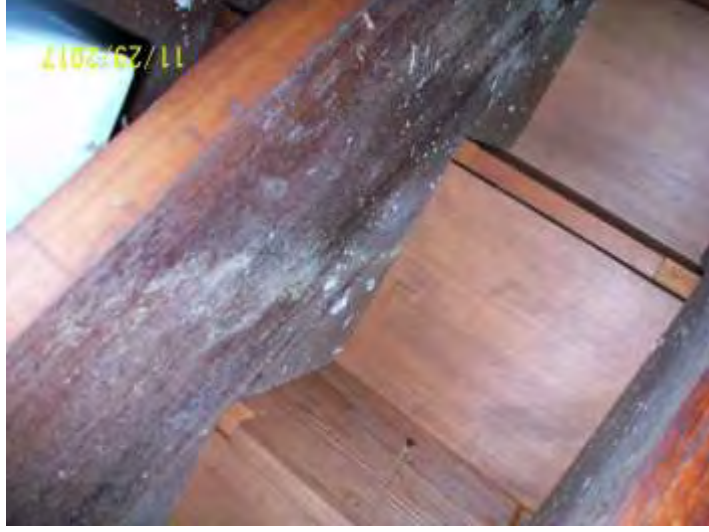
Pic 153\_r



Pic 156\_r

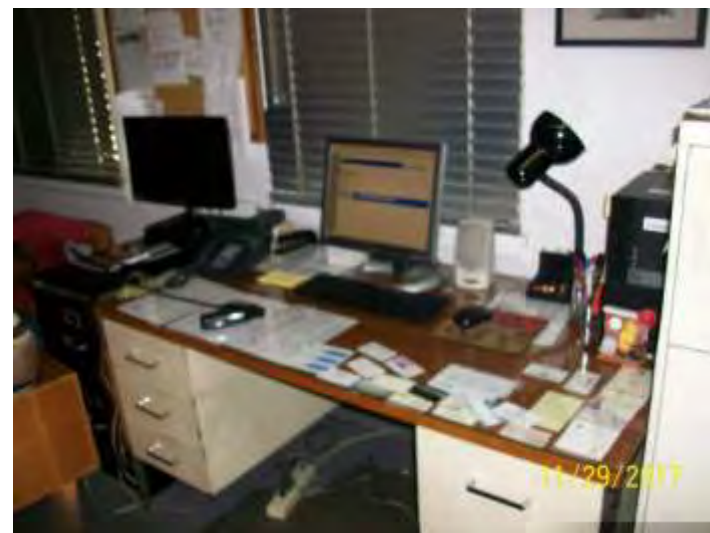


Pic 154\_r





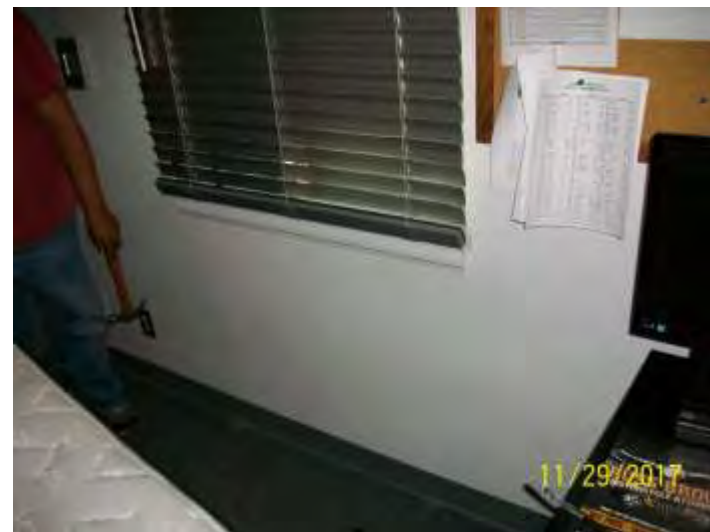
Pic 157\_r



Pic 158\_r



Pic 159\_r



Pic 160\_r



Pic 161\_r



Pic 162\_r



Pic 163\_r



Pic 164\_r





Pic 165\_r



Pic 166\_r



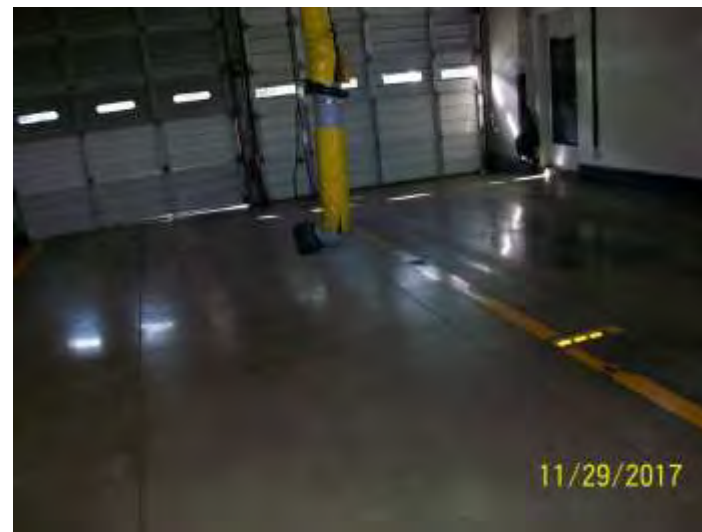
Pic 167\_r



Pic 168\_r



Pic 169\_r



Pic 170\_r



Pic 171\_r



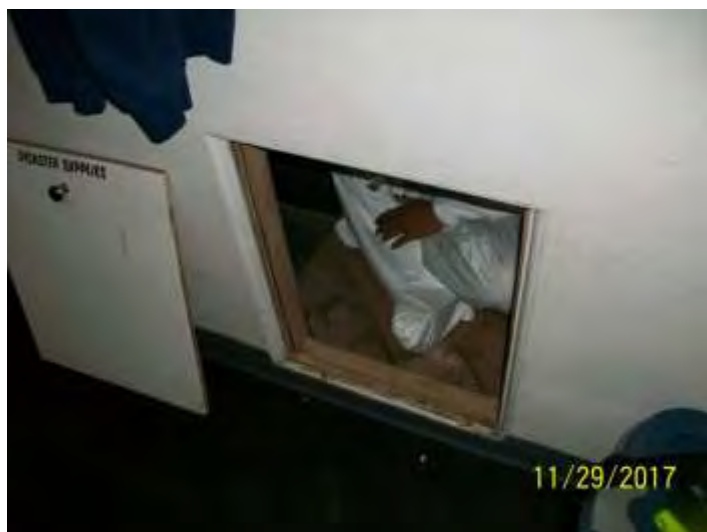
Pic 172\_r



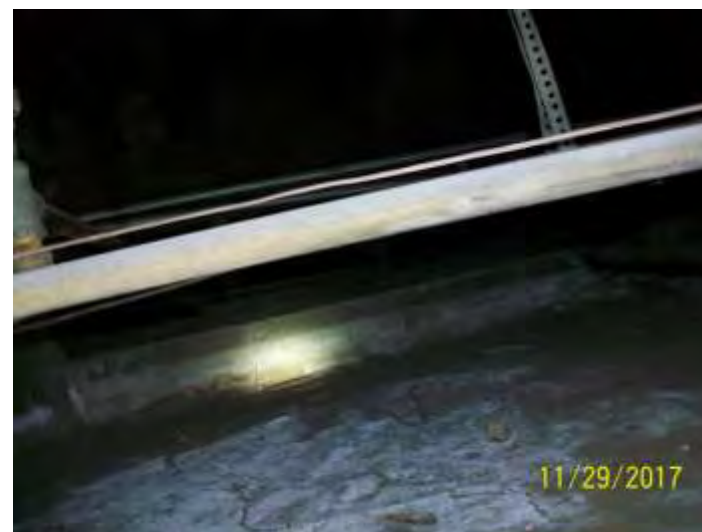
Pic 173\_r



Pic 174\_r



Pic 175\_r



Pic 176\_r



Pic 177\_r



Pic 178\_r



Pic 179\_r



Pic 180\_r





Pic 181\_r



Pic 182\_r



Pic 183\_r



Pic 184\_r



Pic 185\_r



Pic 186\_r



## **APPENDIX II - LABORATORY REPORT**



# LA Testing

5431 Industrial Drive Huntington Beach, CA 92649  
Phone/Fax: (714) 828-4999 / (714) 828-4944  
<http://www.LATesting.com> / [gardengrovelab@lateesting.com](mailto:gardengrovelab@lateesting.com)

Order ID: 331723983  
Customer ID: 32HEAL56  
Customer PO:  
Project ID:

**Attn:** Lab results  
Health Science Associates  
10771 Noel Street  
Los Alamitos, CA 90720

**Phone:** (714) 220-3922  
**Fax:**  
**Collected:** 11/29/2017  
**Received:** 11/01/2017  
**Analyzed:** 12/06/2017

**Proj:** #180034 La, City of Long Beach, 3917 Long Beach Blvd., Fire Station Long Beach, CA

## Test Report: Extended Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Tape Samples (EMSL Method: M041)

Lab Sample Number	Client Sample ID	Location	Fungal Identification	Category
331723983-0001	T-1	Cupula, T-1, beam above cat walk, 2x6, E. w	Alternaria sp.	8%
			Ascospores	4%
			Basidiospores	8%
			Chaetomium sp.	4%
			Cladosporium sp.	19%
			Curvularia sp.	4%
			Hyaline spores	42%
			Myxomycete sp.	12%
Total spores per mm sq=21				
331723983-0002	T-2	Cupula, T-2, W. vent, Louver	Basidiospores	18%
			Cladosporium sp.	24%
			Hyaline spores	47%
			Myxomycete sp.	6%
			Unidentifiable Spores	6%
Total spores per mm sq=14				
331723983-0003	T-3	Cupula, T-3, debris on E. wall, vent, frame, d	Ascospores	10%
			Basidiospores	3%
			Cladosporium sp.	20%
			Epicoccum sp.	10%
			Hyaline spores	43%
			Myxomycete sp.	7%
			Oidium sp.	3%
			Unidentifiable Spores	3%
Total spores per mm sq=25				
331723983-0004	T-4	Attic kitchen spct vis mld T-4	Chaetomium sp.	34% @
			Hyaline spores	<1 %
			Memnoniella sp.	65% @
Total spores per mm sq=10288 @ Active Fertile Colony				
331723983-0005	T-5	Attic duct blanked off, T-5	Alternaria sp.	2%
			Cladosporium sp.	5%
			Hyaline spores	28%
			Myxomycete sp.	62%
			Unidentifiable Spores	2%
Total spores per mm sq=67				

For Information on the fungi listed in this report please visit the Resources section at [www.emsl.com](http://www.emsl.com)



# LA Testing

5431 Industrial Drive Huntington Beach, CA 92649  
Phone/Fax: (714) 828-4999 / (714) 828-4944  
<http://www.LATesting.com> / [gardengrovelab@lateesting.com](mailto:gardengrovelab@lateesting.com)

Order ID: 331723983  
Customer ID: 32HEAL56  
Customer PO:  
Project ID:

**Attn:** Lab results  
Health Science Associates  
10771 Noel Street  
Los Alamitos, CA 90720

Phone: (714) 220-3922  
Fax:  
Collected: 11/29/2017  
Received: 11/01/2017  
Analyzed: 12/06/2017

**Proj:** #180034 La, City of Long Beach, 3917 Long Beach Blvd., Fire Station Long Beach, CA

## Test Report: Extended Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Tape Samples (EMSL Method: M041)

Lab Sample Number	Client Sample ID	Location	Fungal Identification	Category
331723983-0006	T-6	Kitchen, ceiling, suspect mold ,T-6	Chaetomium sp.	98% @
			Hyaline spores	2%
Total spores per mm sq=4019 @ Active Fertile Colony				
331723983-0007	T-7	Kitchen, ceiling, suspect mold ,T-7	Aspergillus sp.	100% @
Total spores per mm sq=9984				
331723983-0008	T-8	Exercise room, T-8, return	Basidiospores	13%
			Chaetomium sp.	3%
			Cladosporium sp.	6%
			Hyaline spores	61%
			Myxomycete sp	16%
Total spores per mm sq=25				
331723983-0009	T-9	Exercise room, T-9, supply	Alternaria sp.	6%
			Basidiospores	12%
			Hyaline spores	69%
			Myxomycete sp.	12%
Total spores per mm sq=13				
331723983-0010	T-10	Movie room, bedroom #1, N. wall staining, T-	Hyaline spores	100%
Total spores per mm sq=2				
331723983-0011	T-11	Exercise room, NE, pos. vis. Mod, T-11	Chaetomium sp.	<1%
			Hyaline spores	7%
			Stachybotrys sp.	93% @
Total spores per mm sq=4327 @ Active, Fertile Colony				
331723983-0012	T-12	Field blank	None Detected	
Total spores per mm sq= N/A				

Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut  
\* = Sample contains fruiting structures and/or hyphae associated with the spores.

Category	Count/area Analyzed
Rare	1 to 10
Low	11 to 100
Medium	101 to 1000
High	> 1000

Samples were received in good condition unless otherwise noted on this report.  
\* Sample contains fruiting structures and/or hyphae associated with the spores.

AIHA-LAP, LLC--EMLAP Accredited #101650

*Cecil Strait*

Cecil Strait, Micro Laboratory Manager  
or Other Approved Signatory

Report amended: 12/06/2017 15:39:02 Replaces initial report from:12/07/2017 08:07:05 Reason Code: Client-Other (see report comment)

For Information on the fungi listed in this report please visit the Resources section at [www.emsl.com](http://www.emsl.com)

**TAPE LIFT SAMPLE DATA SHEET**

5 Day	<b>Project Manager:</b>	Joel Berman	<b>Project Number:</b>	180034La	<b>Date:</b>	11/29/2017
	<b>Client:</b>	City of Long Beach	<b>Ind. Hygienist(s):</b>	Howard Ozar	Kirk Cavalier	
	<b>Project Location:</b>	3917 Long Beach Blvd., Fire Station Long Beach, CA	<b>Comment:</b>			
<input type="checkbox"/> OSHA <input type="checkbox"/> MSHA <input checked="" type="checkbox"/> Other						

Sample Number	Media	Analysis	Description
T-1	Tape Lift	Fungal Spores Drt Exm (LAT M170)	Cupula, T-1 Beam above cat walk, 2x6, E. wall
T-2	Tape Lift	Fungal Spores Drt Exm (LAT M170)	Cupula, T-2, W. Vent, Louver
T-3	Tape Lift	Fungal Spores Drt Exm (LAT M170)	Cupula, T-3, Debri on E. Wall, Vent, Frame, Dark Spotty
T-4	Tape Lift	Fungal Spores Drt Exm (LAT M170)	Attic Kitchen, Spct. Vis. Mld., T-4
T-5	Tape Lift	Fungal Spores Drt Exm (LAT M170)	Attic Duct Blanked Off, T-5
T-6	Tape Lift	Fungal Spores Drt Exm (LAT M170)	Kitchen, Ceiling, Suspect Mold, T-6
T-7	Tape Lift	Fungal Spores Drt Exm (LAT M170)	Kitchen, Ceiling, Suspect Mold, T-7
T-8	Tape Lift	Fungal Spores Drt Exm (LAT M170)	Exercise Room, T-8, Return
T-9	Tape Lift	Fungal Spores Drt Exm (LAT M170)	Exercise Room, T-9, Supply
T-10	Tape Lift	Fungal Spores Drt Exm (LAT M170)	Movie Room, Bedroom #1, N. Wall Staining, T-10

**Special Instructions to Laboratory:**

<b>Relinquished by:</b>	<i>Howard Ozar</i>	<b>Date:</b>	11-30-17	<b>Time:</b>	8:44	<b>Received by:</b>	<i>[Signature]</i>	<b>Date:</b>	11/30/17	<b>Time:</b>	8:45
<b>Relinquished by:</b>		<b>Date:</b>		<b>Time:</b>		<b>Received by:</b>		<b>Date:</b>		<b>Time:</b>	
<b>Relinquished by:</b>		<b>Date:</b>		<b>Time:</b>		<b>Received by:</b>		<b>Date:</b>		<b>Time:</b>	





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#331723983 Page 2 of 2

E-mail results to: [labresults@healthscience.com](mailto:labresults@healthscience.com)[jberman@healthscience.com](mailto:jberman@healthscience.com)[hozar@healthscience.com](mailto:hozar@healthscience.com)

## TAPE LIFT SAMPLE DATA SHEET

5 Day	<b>Project Manager:</b>	Joel Berman	<b>Project Number:</b>	180034La	<b>Date:</b>	11/29/2017
	<b>Client:</b>	City of Long Beach	<b>Ind. Hygienist(s):</b>	Howard Ozar	Kirk Cavalier	
	<b>Project Location:</b>	3917 Long Beach Blvd., Fire Station Long Beach, CA	<b>Comment:</b>			
<input type="checkbox"/> OSHA <input type="checkbox"/> MSHA <input checked="" type="checkbox"/> Other						

Sample Number	Media	Analysis	Description
T-11	Tape Lift	Fungal Spores Drt Exm (LAT M170)	Exercise Room, NE, Pos. Vis. Mod, T-11
T-12	Tape Lift	Fungal Spores Drt Exm (LAT M170)	Field Blank

## Special Instructions to Laboratory:

<b>Relinquished by:</b>	<i>Hawes</i>	<b>Date:</b>	11-30-17	<b>Time:</b>	8:47	<b>Received by:</b>		<b>Date:</b>		<b>Time:</b>	
<b>Relinquished by:</b>		<b>Date:</b>		<b>Time:</b>		<b>Received by:</b>		<b>Date:</b>		<b>Time:</b>	
<b>Relinquished by:</b>		<b>Date:</b>		<b>Time:</b>		<b>Received by:</b>		<b>Date:</b>		<b>Time:</b>	

OrderID: 331723983

## **APPENDIX III - DEEP CLEANING PROTOCOL**





TECHNICAL AND ADVISORY SERVICES • ENVIRONMENTAL HEALTH AND SAFETY

City of Long Beach Protocol Guidance for Contractors

Fire Station #9

3917 Long Beach Blvd.

Long Beach, CA

Stepwise Comprehensive Cleaning Protocol

1. The cleaning scope of work for this project includes all horizontal surfaces in the subject fire station. This includes, but may not be limited to, the sleeping quarters on both levels, the TV room, the exercise room, the kitchen, the shower area, and the captain's office.
2. Install and ensure proper operation of portable air handling system(s) to extract air directly from the remediation containments and discharges air outside the building and away from possible contact with people. Do not discharge air into building interior.
  - a. The ventilation units shall be clean and equipped with new HEPA and pre-filters.
  - b. Replace pre-filters as necessary to maintain airflow.
  - c. Air shall pass through the HEPA filter before discharge.
  - d. The ventilation units to discharge air shall be directed away from building access points and sidewalks.
  - e. The ventilation units shall have a pressure differential gauge to monitor filter loading and auto shutoff and warning system for HEPA filter failure.
  - f. HEPA filters shall have separate hold down clamps to retain filter in place.
  - g. Metal reinforced flexible ductwork, 300 mm (12") diameter maximum will be used to exhaust ventilation units to the building exterior.
  - h. The ventilation units shall have a total rated capacity with filters in place sufficient to provide a minimum of one air change every 20 minutes. Volume of air shall be sufficient to ensure continuous airflow is maintained from clean areas into work area.
  - i. Operate units continuously until all work has been completed.
3. Install critical barriers of 6-mil polyethylene sheeting over all windows, doors, vents, and other possible areas, not directly involved in being cleaned, where an exchange of air between contained and uncontained areas might exist.
4. Deep cleaning of building interior
  - a. Wet wipe and HEPA vacuum all floors and hard surfaces inside the building. Hard surfaces include counter tops, blinds, walls, TV supports, and air conditioning registers, diffusers, and intake areas. Ceilings should be vacuumed if indicated by visual observation.
  - b. HEPA vacuum soft surfaces, such as upholstered furnishings, carpeting, and drapes.
  - c. Follow by cleaning the soft surface materials with steam. Drapery can be professionally cleaned.
  - d. Special attention should be given to cleaning portions of the HVAC/ventilation system. This primarily includes registers and the main units. These components should be thoroughly and professionally cleaned. The main ventilation/air conditioning intake areas should be HEPA vacuumed.
5. Additional work
  - a. Complete any additional work as instructed by the industrial hygiene consultant.
  - b. Work performed in addition to original outline shall be reviewed by industrial hygiene consultant, facility, and the City of Long Beach.

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City of Long Beach Protocol Guidance for Contractors (Cont'd)  
Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, CA

6. Quality Assurance

- a. Ensure work proceeds to schedule, and meets all requirements of this Section. Perform work so airborne particulates do not contaminate areas outside work enclosures.
- b. Use only skilled and qualified workers for all trades required for this work.

7. Oversight

- a. The City of Long Beach and/or their Industrial hygiene consultant will provide direct oversight to ensure the cleaning process is being conducted according to the outlined protocol, and that there is adequate protection of health and safety during the cleaning process.
- b. The City of Long Beach and their Industrial Hygiene consultant are designing a plan to follow-up with post-cleaning testing to ensure particulate is removed.

# **APPENDIX IV - FUNGAL REMEDIATION PROTOCOL**

1. PROJECT BACKGROUND, FINDINGS and SCOPE OF WORK

- a. As identified in HSA's limited preliminary fungal remediation report, it has been determined that fungal growth has impacted building materials (i.e. colonized materials) at, at least three locations in the building. These locations include the following areas.
  - i. The ceiling in the kitchen needs to have fungal remediation performed. The exact amount of ceiling that needs to be removed is approximately 40 square feet.
  - ii. The northeast wall section of the exercise room needs to be remediated. While the amount of visible fungal growth that was present on the room side of the wall in this area appeared to be small (less than one square foot), the amount of growth that could be present in the wall cavity is unknown. Therefore, HSA recommends that as a conservative approach, it should be assumed that the amount of growth at this location requires a medium containment.
  - iii. The north wall of room #3 needs to be further investigated and if fungal growth is present, then a remediation should be performed. If it is determined that an investigation should be performed first, then the remediation contractor who is performing the remediation in the kitchen and exercise rooms should perform this investigation using a glove bag to create a mini-containment and cut a 12 inch (") by 12" hole in the wall to determine whether the areas of visible suspect growth in this area are actually fungal growth or merely dust/dirt that appeared to be fungal growth through the boroscope.
- b. Colonized wall materials located in the above identified areas of the building will need to be removed following these guidelines. The possible exception is the suspected visible fungal growth in room #3, which may first be inspected via a glove bag containment.

2. FUNGI BACKGROUND

- a. Fungi are non-photosynthesising, ubiquitous (i.e. exist in all places), heterotrophic (i.e. they need to ingest nutrients), saprophytic (they eat dead material) organisms. They are either single celled (yeasts) or multicellular organisms that require specific environmental conditions to grow into the vegetative state from a fungal spore. Outdoor fungal spore exposures can range between 500 to 20,000 spores per cubic meter of air (a cubic meter approximately equals 1.3 cubic yards).
- b. The fungal vegetative state includes the growth of certain structures, called reproductive structures. The reproductive structures of fungal growth include conidia, hyphae, and mycelium. These structures, represent, for lack of better terms, flower, stem, stalk, root, etc. The spores (i.e. seeds) grow on the conidia and, like seeds, are dispersed to spread the fungal species to new habitats. Therefore, there is a difference between the presence of fungal growth and finding culturable surface or airborne fungal spores.
- c. Fungal growth on a surface indicates that the specific environmental conditions were met and that culturable (i.e. live) fungal spores were at the location. The

collection of bulk, surface, and or settled dust samples, providing them with a nutrient media, and allowing the spores to culture (grow into the vegetative state) does not confirm that fungal growth occurred at the sampled location. It merely indicates that viable or culturable (i.e. live) fungal spores were at the location. The presence of the structures of reproduction are the only true indicator that fungal growth occurred.

- d. Total spore surface samples are typically collected using transparent tape, which is applied to the desired surface and then applied to a clear glass slide. The sampled surface is then analyzed microscopically to determine the quantity of fungal spores, identified in most cases to genus. The spores are not cultured, therefore, it is unknown whether they are culturable or dead.
- e. The collection of culturable and total fungal samples provides the trained professional different pieces of information related to the sampled environment. The interpretation of the information is the only method available to determine the conditions of the sampled environment. Air sampling is generally considered by the profession as a determiner of presumptive evidence of fungal contamination. Since air sampling cannot identify the presence of fungal growth on surfaces and since there are many sources of fungal spores (i.e. dust, dirt, etc.), air sampling can provide both false positive and false negative results associated with fungal growth. Therefore, surface or bulk sampling is necessary to identify actual fungal growth on surfaces.
- f. The specific environmental conditions for fungal growth to occur are as follows. All of these conditions must be met prior to the germination of the fungal spore into the vegetative state.
  - i. There must be nutrients for the fungal spores to eat. Fungal spores like cellulose, dirt, or any other dead organic material that they can digest.  
  
In our environment there are plentiful amounts of dead organic material for fungi to eat.
  - ii. There must be culturable fungal spores at the location.  
  
This condition is easily met since fungal spores are ubiquitous.
  - iii. Fungal spores require oxygen.  
  
Oxygen is plentiful in our atmosphere.
  - iv. Fungal spores prefer dark places in which to grow, similar to the shadowy places where mushrooms grow.  
  
Wall cavities and unventilated spaces are primary places where fungal growth occurs.
  - v. Fungal spores require water or high levels of relative humidity (i.e. 65 to 70 percent) to grow into the vegetative state.  
  
In some southeastern or Gulf of Mexico states, there is enough natural ambient relative humidity to cause fungal spores to grow into the vegetative state. However, the normal ambient relative humidity levels in

the Southern California environment are generally not high enough to cause fungal spores to grow into the vegetative state. Therefore, water or humidity must be provided from a source other than nature.

- g. Moisture and/or water intrusion into a building is the only environmental factor that is under the control of humans. All other factors are consistently present in our normal environment.
- h. As discussed, fungal growth only occurs when there is sufficient moisture in the environment and moisture can have many origins. These include, but are not limited to, leaks, pipe bursts, sewage back-up events, floods, and elevated relative humidity. In addition, fungal growth is heaviest at the source of water intrusion and decreases with distance away from the origin.
- i. An example of this is a crack in the exterior wall of a building adjacent to a sprinkler. Sprinkler water then routinely enters the building through the crack and saturates the porous, cellulose based wallboard in the building. Fungal growth then occurs on the wall cavity side of the board and can extend into the building with fungal growth beginning to occur in the space between the board and the base coving. In this instance the fungal growth would be heaviest on the cavity side of the wallboard and lighter on the room side.
- j. Conversely, if the moisture source is elevated relative humidity from within the building, the concentration of fungal growth will be heaviest on the room side of the material and may be non-existent in the cavity of the material. In this instance, fungal growth can occur on non-cellulose based materials such as plasters (which are primarily mineral based), windows (i.e. glass panes), fabrics (natural and synthetic), metal (i.e. aluminum window frames), etc., where there is no other food source other than the natural dust deposited on these surfaces.
- k. Specific fungal genera/species are known to produce toxins. These genera/species include, but may not be limited to *Stachybotrys chartarum* (atra), *Aspergillus versicolor*, *Aspergillus flavus*, *Aspergillus fumigatus*, and *Fusarium* sp.. Recently, there has been significant attention spent by the media on the potential human health effects of these toxins. While there is significant evidence to confirm that exposure to significant amounts of toxins, primarily via ingestion or airborne exposure related to specific industrial occupations (i.e. agriculture, animal handling, etc.) can produce toxicosis and disease, recent articles have identified that exposure to indoor air concentrations of spores will not produce such effect in humans. The Morbidity and Mortality Weekly Report<sup>11</sup>, a publication of the Centers for Disease Control, states . . . “pulmonary hemorrhage/hemosiderosis in infants in Cleveland and household water damage or exposure to *S. chartarum* are not substantiated adequately by the scientific evidence produced in the CDC investigation (2-4). Serious shortcomings in the collection, analysis, and reporting of data resulted in inflated measures of association and restricted interpretation of the reports. The associations should be considered not proven; the etiology of AIPH is unresolved”. In short, the CDC now states that they have no substantive evidence to conclude that *S. chartarum* caused the Cleveland baby case.

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<sup>11</sup>Morbidity and Mortality Weekly Report, March 10, 2000 / 49(09);180-4,  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4909a3.htm>.



- l. In addition, Page and Trout<sup>12</sup> have concluded that while there exists anecdotal evidence between fungal growth, mycotoxin production by fungi, and suspected health effects, . . . “there is inadequate evidence to support the conclusion that exposures to mycotoxins in the indoor (nonindustrial) environment is causally related to symptoms or illness among building occupants.”
- m. An Evidence-Based Statement issued on October 27, 2002 by the American College of Occupational and Environmental Medicine (ACOEM) states “Some molds that propagate indoors may, under some conditions, produce mycotoxins that can adversely affect living cells and organisms by a variety of mechanisms. Adverse effects of molds and mycotoxins have been recognized for centuries following ingestion of contaminated foods. Occupational diseases are also recognized in association with inhalation exposure to fungi, bacteria, and other organic matter, usually in industrial or agricultural settings. Molds growing indoors are believed by some to cause building-related symptoms. Despite voluminous literature on the subject, the causal association remains weak and unproven, particularly with respect to causation by mycotoxins. One mold in particular, *Stachybotrys chartarum*, is blamed for a diverse array of maladies when it is found indoors. Despite its well-known ability to produce mycotoxins under appropriate growth conditions, years of intensive study have failed to establish exposure to *S. chartarum* in home, school, or office environments as a cause of adverse human health effects. Levels of exposure in the indoor environment, dose-response data in animals, and dose-rate considerations suggest that delivery by the inhalation route of a toxic dose of mycotoxins in the indoor environment is highly unlikely at best, even for the hypothetically most vulnerable subpopulations.”<sup>13</sup>
- n. In their Evidence-based Statement the ACOEM concurs with the concept that when fungal growth is identified in indoor environments, the source of the moisture that caused the fungal growth to occur should be identified and corrected and that the colonized building materials should be removed.
- o. While the presence of fungal growth inside of occupied buildings is considered unacceptable, due to the type of environments that we humans like to inhabit in, fungal growth is present, in small quantities, in the vast majority of buildings. This includes, but is not limited, to mildew in bathrooms and showers (mildew is another term that means mold), lumberyard mold growth on wood structural members which has been a normal and accepted part of wood for many years, mold on food supplies (i.e. bread and cheese molds, etc.), mold that occurs due to over-watered house or office plants, etc.
- p. Therefore, based on the above descriptions, fungal exposures occur daily and we are all exposed to a certain amount of fungal growth and spores.

### 3. STANDARDS AND GUIDELINES

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<sup>12</sup>The Role of *Stachybotrys* Mycotoxins in Building-Related Illness, E. Page and D. Trout, *AIHAJ*, 62:644-648 (2001).

<sup>13</sup>Adverse Health Effects Associated with Molds in the Indoor air, Bryan D. Hardin, et. al., American College of Occupational and Environmental Medicine, Evidence-based Statement, October 27, 2002, <http://www.acoem.org/guidelines/article.asp?ID=52>.

- a. Standards and guidelines are often used as a reference point to assess safety. For airborne contaminants, concentrations measured are compared with federal or state regulatory standards and/or professionally recommended values.
- b. For occupational exposures, reference values are published by the American Conference of Governmental Industrial Hygienists (ACGIH) and regulatory standards are set by both federal and state Occupational Safety and Health Administrations, OSHA and Cal/OSHA.
- c. Both regulatory standards and ACGIH guidelines are designed to protect workers from exposure to unhealthful concentrations of airborne substances. However, the levels established by these bodies may not necessarily eliminate all effects for all people, e.g., mild irritations, response to odors, unique sensitivity.
- d. Regulatory or Professional Organizations for Bioaerosol Exposure
  - i. Currently, there are no regulatory standards promulgated by any governmental agency with respect to levels of microbiological organisms or bioaerosols in public or private buildings.
  - ii. Based on health hazard evaluations conducted by the National Institute of Occupational Safety and Health (NIOSH), Morey, et. al.<sup>14</sup> it was suggested in 1984 that a "level of viable microorganisms in excess of  $1 \times 10^3$  CFUs/m<sup>3</sup> indicates that the indoor environment may be in need of investigation and improvement".
  - iii. In 1986 the ACGIH Committee on Bioaerosols<sup>15</sup> proposed that "total counts exceeding 10,000 CFUS/m<sup>3</sup> indicate a need to proceed to remedial actions." However, the 1989 ACGIH Guidelines for the Assessment of Bioaerosols in the Indoor Environment<sup>16</sup> now recommend the use of rank-order comparisons of indoor and outdoor air sample populations, rather than specifying threshold concentrations that require remediation. The ACGIH and others also recommend that if air samples are collected, the scope of work should include multiple rounds of indoor and outdoor air samples to attempt to identify the natural variation of spore concentrations in both the indoor and outdoor air.
- e. Current Standard of Practice for Bioaerosols
  - i. In lieu of promulgated regulatory or recommended guidelines, and as a result of the rapidly expanding knowledge concerning collection methods,

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<sup>14</sup> Morey, P. R., Hodgson, M. J., Sorenson, W. G., Kullman, G. H., Rhodes, W. W., and G. S. Visvesvara. 1984. Environmental studies in moldy office buildings: biological agents, sources and preventive measures. Ann Am. Conf. Gov, Ind, Hyg. 10:21-35

<sup>15</sup> Morey, P. R., Otten, J., Burge, H. A., Chatigny, M., Feeley, J., LaForce, F. M., and K. Peterson. 1986. Airborne viable microorganisms in office environments: sampling protocol and analytical procedures (Draft Report). Appl. Ind. Hyg. I:R19-R23

<sup>16</sup> Burge, H. A., Kreiss, K., Morey, P. R., Otten, J., Peterson, K., Chatigny, M., and J. Freeley. 1987. Guidelines for assessment and sampling of saprophytic bioaerosols in the indoor environment. Appl. Ind. Hyg, 2 (5):R10-R16

professional Industrial Hygiene practitioners have begun to define and apply the following general approaches in assessing bioaerosols in the indoor environment.

- ii. To credibly conclude that there is or is not a fungal problem within a building, an investigator must carefully evaluate the fungal content of the outdoor environment surrounding the building. Fungal concentrations outdoors may range from 1,000-100,000 CFUs/m<sup>3</sup> and influence indoor conditions via infiltration and mechanical intake of outdoor air<sup>17</sup>. As a general rule, indoor fungal problems are usually indicated when a significant difference is demonstrated between indoor and outdoor airborne spore concentrations or types of spore genera or species.
- iii. It has been established that airborne spore concentrations collected and analyzed according to standard "viable" techniques, underestimate the total number of spores that are potentially present. Burge, et al.<sup>18</sup>, demonstrated that as spore levels rose, culture plate data progressively underestimated prevailing concentrations with recoveries falling below 5% at airborne levels above 500 spores/m<sup>3</sup>. Collection and analysis of total airborne spores (in addition to viable spores) is now considered essential in evaluating potential fungal magnification.
- iv. In 1993, Buttner and Stetzenbach<sup>19</sup> established that air sampling without concomitant surface sampling may not adequately reflect the level of microbial contamination in indoor environments. It is now recognized that surface samples should be collected to evaluate general levels of microorganisms present and to verify that fungal growth is found. In lieu of any promulgated regulatory or recommended guidelines for surface levels, professional Industrial Hygiene practitioners have defined a general surface level of under 50 spores per square millimeter (s/mm<sup>2</sup>) as a concentration that should not produce complaints or allergic reactions. If the surface levels are below 10 s/mm<sup>2</sup>, then the building is considered to be clean.

#### 4. WORKER TRAINING

- a. Prior to entering the building during cleaning and remediation activities, workers must receive adequate fungal remediation training. This training requirement is not intended to be the only training provided to the workers. Workers should have been trained and/or have experience in other hazardous materials

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<sup>17</sup> American Conference of Governmental Industrial Hygienists. 1989. Guidelines for the assessment of bioaerosols in the indoor environment, American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio.

<sup>18</sup> Burge, H. A., Boise J. R., Rutherford, J. A., and W. R. Solomon 1977. Comparative recoveries of airborne fungus spores by viable and non-viable modes of volumetric collection. *Mycopathologia* 61: 27-33.

<sup>19</sup> Buttner, M. P., and Stetzenbach, L. D., 1993. Monitoring airborne fungal spores in and experimental indoor environment to evaluate sampling methods and the effects of human activity on air sampling. *Applied and Environmental Microbiology* 59:219-226

remediation, such as, but not limited to, asbestos and/or lead-based paint (LBP) abatement training.

- b. The employer(s) of the cleaning workers shall provide evidence that every one of his (their) employees who will enter the building during fungal remediation activity has received training in respiratory protection as required by 8 CCR 5144.
- c. To accommodate the removal of materials from surfaces with the presence of lead, a minimum of two (2) workers must also have received, at minimum, lead related training pursuant to the requirements of 8 CCR 1532.1.

## 5. SELECTION

Persons with history of allergies or sensitizations should not be assigned to work on this project.

## 6. APPLICABLE STANDARDS AND GUIDELINES/DOCUMENTS INCORPORATED BY REFERENCE

- a. Since there are no specific OSHA and Cal/OSHA regulations related to fungus, all work under this contract shall be performed in strict accordance with all applicable federal, state and local regulations, standards and codes governing asbestos related work and any other trade work done in conjunction with construction.
- b. The most recent editions of all relevant regulations, standards, documents or codes shall be in effect. Where conflict among the requirements or with these specifications exists, the most stringent requirements shall apply. Such documents include, but are not limited to, the following:
  - i. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA)
    - (1) Respiratory Protection Standard (29 CFR 1910.134);
    - (2) Hazard Communication (29 CFR 1910.1200); and
    - (3) Specifications for Accident Prevention, Signs and Tags (29 CFR 110.145).
  - ii. California Division of Occupational Safety and Health (DOSH)
    - (1) Title 8 of the California Code of Regulations, General Industry Safety Orders, (8 CCR GISO) including but not limited to:
      - Section 5144: Respiratory Protection;
      - Section 2405.Chapter 4: Electrical Safety Orders;
      - Section 1637,1640,1658: Scaffolding;
      - Section 1513: Housekeeping;
      - Section 5194: Hazard Communication (Employees Right-to-Know);
      - Section 1675: Ladders;
      - Section 3215,3220: Egress and Emergency Plans;
      - Section 1514: Personal Protective Equipment;
      - Section 1519: Sanitation;

Section 3360: Sanitation;  
Section 1684, 3555, 3556: Powered Hand Tools;  
Section 1502: Contractors Responsibilities;  
Section 1511: General Safety and Health Provisions;  
Section 1510: Safety Training and Education;  
Section 1527 and 3366: Washing Facilities;  
Section 1528: Gases, Vapors, Fumes, Dust and Mists;  
Section 1531 and 5143: Ventilation;  
Section 1532.1: Lead In Construction;  
Section 3203: Injury and Illness Prevention Program;  
Section 3204: Access to Employee's Exposure and Medical Records;  
Section 6003: Accident Prevention Signs;  
Section 1537: Ventilation: Welding, Cutting or Heating of Metal of Toxic Significance.  
Section 5156 and 5158: Confined Spaces (as applicable to such areas as crawlspaces, etc.)

- iii. ANSI Z9.2-Fundamentals Governing the Design and Operation of Local Exhaust Systems.
- iv. National Electric Code
- v. New York City Department of Health & Mental Hygiene, Bureau of Environmental & Occupational Disease Epidemiology, Guidelines on Assessment and Remediation of Fungi in Indoor Environments.
- vi. USEPA, Mold Remediation in Schools and Commercial Buildings.
- c. Compliance with the requirements of applicable Standards and Guidelines whether listed in this specification or not will be strictly enforced by the City of Long Beach and/or its Industrial Hygiene (IH) Consultant.
- d. The City of Long Beach representative or designee has final authority on project scheduling, completion of scope of work, regulatory conflict and specification interpretation.

## 7. PROTECTIVE CLOTHING

- a. Whenever inside the subject facility performing actual remediation work, the workers shall wear a Tyvek® type coverall and impervious boots or protective foot coverings. At a minimum, NIOSH approved half-face air purifying respirators with HEPA (i.e. N100, or P100 if oil-based products are being used) cartridges. If the Safety Data Sheet (SDS) related to the anti-fungal encapsulant recommends additional personal protection (i.e. organic vapor, acid gas, etc.) cartridges, then combination cartridges shall be worn. The employer(s) shall provide current proof (within the past year) of qualitative or quantitative fit testing and medical approval to wear an air purifying respirator for each worker.
- b. Prior to the start of work the employer(s) shall submit a copy of his (their) written respiratory protection program(s) that are in compliance with 8 CCR 5144 to the authorized representative.

8. LEVEL OF ISOLATION

- a. The subject building contains three areas with documented colonized building materials. The containments for the remediation shall be designed using the Medium Areas (greater than 10 square feet [ft<sup>2</sup>] but less than 100 ft<sup>2</sup>, in a contiguous area) pursuant to using the New York Department of Health, Bureau of Environmental & Occupational Disease Epidemiology, Guidelines on Assessment and Remediation of Fungi in Indoor Environments (i.e. the New York Guidelines) with the exception that a company experienced in fungal remediation shall perform the work instead of trained building maintenance workers.
- i. Properly trained and equipped mold remediation workers should conduct the remediation. The presence of a trained building or environmental health professional (i.e. Health Science Associates) to provide oversight during remediation may be helpful to ensure quality work and compliance with the work plan. The following procedures are recommended:
  - (1) Personnel trained in the handling of mold-damaged materials equipped with:
    - (a) A minimum of half-face elastomeric respirators with P-100 filters used in accordance with the OSHA respiratory protection standard (29 CFR 1910.134/Title 8, CCR 5144);
    - (b) Full body coveralls with head and foot coverings; and
    - (c) Gloves and eye protection.
  - ii. Personnel trained in the handling of mold-damaged materials shall follow these procedures.
    - (1) The affected area shall be contained following these procedures:
      - (a) The HVAC system servicing this area should be shut down during remediation;
      - (b) Isolation of the work area using plastic sheeting sealed with duct tape;
      - (c) Furnishings should be removed from the area;
      - (d) Ventilation ducts/grills, any other openings, and remaining fixtures/furnishings should be covered with plastic sheeting sealed with duct tape;
      - (e) A HEPA equipped negative air machine shall be used to filter the air and to generate negative pressurization enclosure to achieve a minimum of four air changes per hour;
      - (f) Airlocks shall be used to separate chambers in the decon;
      - (g) Egress pathways should also be covered if a clean changing room is not used; and
      - (h) The work area should be unoccupied.
    - (2) Efforts should be made to reduce dust generation. Dust suppression methods particularly during any cutting or resurfacing of materials are highly recommended. Methods to consider include: cleaning or gently misting surfaces with a dilute soap or detergent solution prior to removal; the use of High-Efficiency Particulate Air (HEPA) vacuum-shrouded tools; or using a vacuum equipped with a HEPA filter at the point of dust generation. Work practices that create excessive dust should be avoided.
    - (3) Moldy materials, that can be cleaned, should be cleaned using a soap or detergent solution. Materials that cannot be cleaned should



be removed from the building in sealed plastic bags. The outside of the bags should be cleaned with a damp cloth and a soap or detergent solution or HEPA-vacuumed in the work area (or clean changing room) prior to their transport to unaffected areas of the building. There are no special requirements for the disposal of moldy materials.

- (4) Before leaving isolated areas, workers should remove disposable clothing to prevent the tracking of mold-containing dusts outside of the work area.
- (5) The work area and egress pathways (and clean changing room if present) should be HEPA-vacuumed and cleaned with a damp cloth and/or mop with a soap or detergent solution and be visibly clean prior to the removal of isolation barriers. Plastic sheeting should be discarded after use.
- (6) All areas should be left dry and visibly free from mold, dust, and debris. Check that other quality assurance indicators have also been met.

- iii. A two chamber decon/vestibule with a dirty room and clean room, separated by air locks, shall be erected the entrance to the work area.

## 9. ADDITIONAL REQUIREMENTS

If there are areas where the material to be exposed impacts known/suspect ACM or asbestos containing construction material (ACCM), then additional containment requirements must be met. In addition, if ACM or ACCM is impacted, then additional contractor licenses and certifications will be required.

## 10. REMEDIATION PROCEDURES

- a. Torn coveralls shall be repaired or replaced immediately. When leaving the building to eat, drink, or go home, the boots shall be removed and the coveralls shall be removed by inverting them in the process. Workers shall wash their hands and faces prior to eating or drinking.
- b. When leaving the building for the last time each shift, the boots shall be disinfected by immersing them up to ankle height in a hypochlorite (bleach) solution for at least 15 seconds.
- c. The cleaning and/or removal of the colonized building materials from this building is to be performed with dust control measures. The generation of dust as a result of the remediation is to be controlled using a minimal amount of water. If non-colonized building materials become wet, it is the responsibility of the contractor to ensure that the wet building materials are dried quickly (i.e. within 24 hours or less) so that fungal growth does not occur or the materials shall be replaced at the contractors expense. Therefore, only low volume water delivery systems (i.e. Hudson type sprayers) are to be allowed in the work area.

## 11. INSPECTIONS

- a. During the project, the Industrial Hygiene (IH) Consultant shall perform periodic inspections of the work to ensure that the work is being performed in accordance with all applicable guidelines, regulations and these specifications. The inspections will address the condition of the established work area (i.e. barriers,

organization, waste storage, etc.), cleanliness of the area outside of the work area, condition of decontamination facilities, supplies, etc.

- b. During these inspections, the IH Consultant may collect surface and/or air samples inside and/or outside of the containment to document the effectiveness of the project controls. Air sampling may include both culturable and total spore techniques and samples shall be collected at multiple sampling locations both inside and outside of the containment.
- c. If there are instances where the IH Consultant determines that the contractor is deficient in meeting the requirements of the applicable guidelines and regulations and these specifications, corrections shall be requested. These requests shall be provided to the contractor's Project Foreman and/or Project Manager. If after these attempts fail to correct the deficiencies, then the IH Consultant shall inform the building owner of the deficiencies and the attempts for correction. The building owner or its designee shall have final say in all instances.

## 12. POST REMEDIATION FUNGAL SAMPLING

- a. The post remediation process includes both a visual inspection and the collection of air and surface samples at the conclusion of a project. Therefore, the post remediation process shall be performed in at least three stages; 1) passage of visual inspection(s); 2) collection of surface samples; and 3) the collection of total spore air samples.
- b. Surface evaluation and sampling shall be performed using cloth test and tape lift total spore surface sampling techniques.
  - i. To assure that all surfaces are visually clean, surfaces within the containment shall be wiped with white and black cloth swatches (cloth test) to determine the presence of any dust or debris. If dust or debris is evident on the swatches then the Remediation Contractor will re-clean the containment.
  - ii. The tape samples shall be collected from representative surfaces inside of the containments (avoiding lumberyard mold). The tape samples shall also be collected from a representative number of locations. Acceptable post remediation shall be considered achieved when tape/surface counts have been determined to be less than 10 spores per square millimeter (s/mm<sup>2</sup>) of surface space, with no fungal growth, and with no toxigenic spores present. If greater than 10 s/mm<sup>2</sup> or if any of the toxigenic fungal spores are identified on the post remediation samples, then the contractor will be required to re-clean the work area.
  - iii. The interior air samples shall be collected at an approximate rate of one sample per 100 square feet of floor surface area, with a minimum of two samples inside of each containment, one outside of the containment but inside of the building (if applicable), and at least two exterior air samples shall also be collected. The samples shall be collected and analyzed using the total spore method. The results of the inside containment air samples shall be compared to the ambient conditions which exist in the area. Post remediation shall be achieved when the average of the counts inside the containments are determined to be not significantly higher than the average of the counts outside of the building and with no toxigenic spores present, unless identified in the ambient air samples.

City of Long Beach Protocol Guidance for Contractors - Page 1

Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, CA

Stepwise Comprehensive Cleaning Protocol

1. The cleaning scope of work for this project includes all horizontal surfaces in the subject fire station. This includes, but may not be limited to, the sleeping quarters on both levels, the TV room, the exercise room, the kitchen, the shower area, and the captains office.
2. Install and ensure proper operation of portable air handling system to extract air directly from the remediation containments and discharges air outside the building and away from possible contact with people. Do not discharge air into building interior.
  - a. The ventilation units shall be clean and equipped with a new HEPA and pre-filters.
  - b. Replace pre filters as necessary to maintain airflow.
  - c. Air shall pass through the HEPA filter before discharge.
  - d. The ventilation units to discharge air shall be directed away from building access points and sidewalks.
  - e. The ventilation units shall have a pressure differential gauge to monitor filter loading and auto shutoff and warning system for HEPA filter failure.
  - f. HEPA filters shall have separate hold down clamps to retain filter in place.
  - g. Metal reinforced flexible ductwork, 300 mm (12") diameter maximum will be used to exhaust ventilation units to the building exterior.
  - h. The ventilation units shall have a total rated capacity with filters in place sufficient to provide a minimum of one air change every 20 minutes. Volume of air shall be sufficient to ensure continuous airflow is maintained from clean areas into work area.
  - i. Operate units continuously until all work has been completed.
3. Install critical barriers of 6-mil polyethylene sheeting over all windows, doors, vents, and other possible areas where an exchange of air between contained and uncontained areas might exist.
4. Deep cleaning of building interior
  - a. Wet wipe and HEPA vacuum all floors and hard surfaces inside the building. Hard surfaces include counter tops, blinds, walls, TV supports, and air conditioning registers, diffusers, and intake areas. Ceilings should be

Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, CA

- vacuumed if indicated by visual observation.
  - b. HEPA vacuum soft surfaces, such as upholstered furnishings, carpeting, and drapes.
  - c. Follow by cleaning the soft surface materials with steam. Drapery can be professionally cleaned.
  - d. Special attention should be given to cleaning portions of the HVAC/ventilation system. This primarily includes registers and the main units. These components should be thoroughly and professionally cleaned. The main ventilation/air conditioning intake areas should be HEPA vacuumed.
- 5. Additional work
  - a. Complete any additional work as instructed by the industrial hygiene consultant.
  - b. Work performed in addition to original outline shall be reviewed by industrial hygiene consultant, facility, and the City of Long Beach.
- 6. Quality Assurance
  - a. Ensure work proceeds to schedule, and meets all requirements of this Section. Perform work so airborne particulates do not contaminate areas outside work enclosures.
  - b. Use only skilled and qualified workers for all trades required for this work.
- 7. Oversight
  - a. The City of Long Beach and/or their Industrial hygiene consultant will provide direct oversight to ensure the cleaning process is being conducted according to the outlined protocol, and that there is adequate protection of health and safety during the cleaning process.
  - b. The City of Long Beach and their Industrial Hygiene consultant are designing a plan to follow-up with post-cleaning testing to ensure particulate is removed.

*Addendum #1 to the Fungal Remediation Guideline Related to the City of Long Beach, Fire  
Station No. 9*

December 18, 2017

Joleen Richardson, CSP  
City Safety Officer  
City of Long Beach  
333 West Ocean Blvd., 10th Floor  
Long Beach, CA 90802

Re: Addendum #1 to the fungal remediation guideline related to the City of Long Beach, Fire Station #9, 3917 Long Beach Blvd., Long Beach, CA; HSA Project Number 180034LA.

Dear Ms. Richardson:

Pursuant to our discussions with Ingrid Zubieta, here is addendum #1 to the fungal remediation guideline related to the referenced project. Below, we are also discussing two other items that were included in our discussion.


In regards to our discussion related to the carpet in the exercise room, this carpet can easily be cleaned and should be cleaned as part of the deep cleaning protocol that was included as Appendix III of our report dated December 13, 2017 associated with this site. If the carpet is to be removed, and if the carpet is glued-down, then additional bulk asbestos sampling of the carpet adhesive/mastic will need to be performed prior to its removal.

During the job walk of December 14, 2017, there was a reported discussion related to the collection of pre-project background fungal air samples in the building. It was reported that the contractor was concerned that due to the dust level of the building, that meeting the air sampling post remediation criteria would be difficult to meet, since it appears that the deep cleaning will be performed post remediation. When HSA prepared the deep cleaning protocol, we assumed that the deep cleaning would be performed either prior to or concurrently with the remediation. In the attached addendum to the remediation guidelines, HSA has included a section to deal with this issue.

If you have any questions regarding this report, please feel free to contact us at (714) 220-3922.

Performed

Reviewed By

  
Joel I. Berman, CIH, CSP, CAC, CDPH LST  
CIAQM  
Vice President

  
Kathy S. Jones, CIH, CDPH I/AP, CIAQM  
Vice President

cc: Ingrid Zubieta  
Kevin Burke







TECHNICAL AND ADVISORY SERVICES • ENVIRONMENTAL HEALTH AND SAFETY

Addendum #1 - Fungal Remediation Guideline  
City of Long Beach, Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, CA - HSA Project Number 180034LA

1. LEVEL OF ISOLATION

In addition to the requirements related to the isolation of the kitchen ceiling remediation, which are included in the original Fungal Remediation Guideline dated December 13, 2017, the contractor shall add a poly barrier in the attic above the kitchen.

2. POST REMEDIATION FUNGAL SAMPLING

As part of the post remediation total spore air sampling, HSA will also collect two total spore air samples inside of the non-contained areas of the building. These areas will also be considered to be similar to ambient outdoor samples when evaluating whether the spore concentrations inside of the containment have met the post remediation criteria.

*Limited bulk asbestos and lead-based paint survey of specific ceiling and walls of the City of  
Long Beach Fire Station No. 9*



TECHNICAL AND ADVISORY SERVICES • ENVIRONMENTAL HEALTH AND SAFETY

December 21, 2017

Ms. Joleen Richardson, CSP  
City of Long Beach  
Department of Human Resources  
333 West Ocean Blvd., 10<sup>th</sup> Floor  
Long Beach, CA 90802

Re: Limited bulk asbestos and lead-based paint survey of specific ceiling and walls of the City of Long Beach Fire Station 9, located at 3917 Long Beach Blvd., Long Beach, CA; performed on December 14, 2017; HSA Project Number: 180081LA.

Dear Ms. Richardson:

Pursuant to your request, Health Science Associates (HSA) performed a limited bulk asbestos and lead-based paint (LBP) survey at the above referenced location for the determination of asbestos containing materials (ACM) and lead coated components.

This project was performed on December 14, 2017 by Kirk A. Cavalier, Sr., California Certified Site Surveillance Technician (SST), California Department of Public Health (CDPH) Lead Sampling Technician (LST) with assistance provided by Hovaness Dekeyan, Industrial Hygienist (IH), SST; CDPH Lead Inspector/Assessor (I/A). The project was performed under the direction of Joel I. Berman, Certified Industrial Hygienist (CIH), Certified Safety Professional (CSP), Certified Asbestos Consultant (CAC), Certified Indoor Air Quality Manager (CIAQM), CDPH LST, Vice President.

### **Asbestos**

The collection of suspect ACM samples was performed to determine if the sampled materials were either ACM, defined by the EPA as any material containing greater than one (1%) percent asbestos or asbestos containing construction material (ACCM), defined by the State of California as any construction material containing greater than 0.1 percent (0.1%) asbestos. The suspect asbestos samples were analyzed via polarized light microscopy (PLM) with dispersion staining in accordance with EPA method 600/R-93-116. The lower limit of reliable quantification for this method is 1%.

### **Lead**

The lead survey was performed utilizing accepted professional methodologies for the collection of paint chip bulk samples. The samples are analyzed using Inductively Coupled Argon Plasma, Atomic Emission Spectroscopy (ICAP, AES) in accordance with EPA method 6010 or Flame

Atomic Absorption (FAA), in accordance with EPA method 3050B/7000B. Laboratory results in surface coatings that contain an amount of lead equal to or greater than 5,000 parts per million (ppm) or 0.5 Wt% (percent lead by weight) are classified as LBP per the CDPH Title 17 definition. Laboratory results greater than 90 ppm/0.009 WT%, but less than LBP levels are classified as lead containing paint (LCP) per the Consumer Product Safety Commission's (CPSC) guidelines. The paint sampling was performed for the purpose of contractor notification for OSHA compliance.

After sample collection, all samples needing laboratory analysis were transported via chain-of-custody procedures to LA Testing's Huntington Beach, CA laboratory for analysis. LA Testing is part of a larger, nation-wide laboratory organization known as EMSL. These laboratories maintain accreditations by the American Industrial Hygiene Association (AIHA), the National Voluntary Laboratory Accreditation Program (NVLAP), the California Department of Public Health Environmental Laboratory Accreditation Program (ELAP), and AIHA's Environmental Lead Laboratory Accreditation Program (ELLAP).

The laboratory reports with chain-of-custody documentation are located in Appendix A. A photographic exhibit of the sample locations is provided as Appendix B.

### **Exclusions/Limitations**

This site and sampling investigation did not access hidden or unknown portions of the building or sample in areas not identified by the Owner.

HSA's scope of work did not include collection of samples for any other suspect hazardous materials (i.e. soil, ground water, PCB light ballasts, florescent light tubes, etc.), which may or may not have been utilized or installed at the building during the course of construction or normal operations.

### **ASBESTOS STANDARDS AND GUIDELINES**

Asbestos Containing Material (ACM) - Any material containing more than one percent asbestos, as defined by the EPA.

Asbestos Containing Construction Material (ACCM) - Any manufactured construction material which contains more than one-tenth of one percent asbestos by weight, as defined by the State of California.

If the total amount of ACM or ACCM to be abated is greater than 100 square feet the following regulations must be met.

- *South Coast Air Quality Management District (SCAQMD), Rule 1403*, this rule requires District notification and removal of all ACM items (friable and non-friable) from a building prior to demolition. It requires the use of a state certified and a registered asbestos abatement contractor and a ten (10) day written notification for asbestos disturbance activities greater than 100 square feet. However, no notification is required if there is less than 100 square feet of ACM in the building.
- *Labor Code 6501.5*, requires the use of a state certified and registered asbestos abatement contractor for all asbestos removal projects of more than 100 square feet of ACCM or ACM.
- *Federal Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1101*, California Code of Regulation (CCR) Title 8 § 1529 and § 5208 require employers to monitor the exposure of their employees who may be exposed to asbestos. If employees are exposed above certain criteria, the employer must take action to limit the employee's exposure to asbestos and to protect the employee's health. Per these regulations, the permissible exposure limit (PEL) for asbestos is 0.1 fibers per cubic centimeter of air (f/cc) expressed as an eight-hour time weighted average (TWA).
- *Environmental Protection Agency (EPA) National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR Part 61, Subpart M* requires the inspection for asbestos-containing building materials (ACBM) prior to any planned renovation or demolition of a building. If ACBM has been identified it specifies work practice standards designed to minimize the release of asbestos fibers, such as the use of wet methods during building demolition or renovation, sealing waste in leak tight containers, transportation and disposal of waste material as expediently as practicable. The regulation also requires the owner or the operator of the renovation or demolition operation to notify the appropriate delegated entity (often a state agency) before any demolition or before any renovations of buildings when the amount of Regulated Asbestos Containing Material (RACM) is greater than 260 linear feet, 160 square feet or 35 cubic.

## **LEAD STANDARDS AND GUIDELINES**

- The *Federal Department of Housing and Urban Development (HUD)* suggests abatement when XRF readings are at or above 1.0 milligram per square centimeter (mg/cm<sup>2</sup>) or 0.5 WT% (percent lead by weight) via laboratory analysis.
- *California Department of Public Health (CDPH)*, Title 17 defines "Lead Based Paint" (LBP) as paint or other surface coatings that contain an amount of lead equal to, or in excess of 1.0 mg/cm<sup>2</sup> or 0.5 WT%; "Lead Contaminated Dust" is defined as dust that contains an amount of lead equal to, or in excess of, 40 micrograms per square foot

( $\mu\text{g}/\text{ft}^2$ ) for interior floor surfaces, 250  $\mu\text{g}/\text{ft}^2$  for interior horizontal surfaces, and 400  $\mu\text{g}/\text{ft}^2$  for exterior floor and horizontal surfaces. “Lead Contaminated Soil” is defined as bare soil that contains an amount of lead equal to, or in excess of, 400 ppm in children’s play areas and 1000 parts per million (ppm) in all other areas. “Lead Hazard” is defined as deteriorated LBP, lead contaminated dust, lead contaminated soil, disturbing LBP or presumed LBP without containment, or any other nuisance which may result in persistent and quantifiable lead exposure.

- *Consumer Product Safety Commission’s (CPSC)* definition of lead containing paint is greater than 0.009 WT% or 90 ppm lead by weight effective August 2009. In 1978 the CPSC banned lead in excess of 0.06 WT% for paint used in residences or on toys.
- *Los Angeles County Code, Title 11, Health and Safety Chapter 11.28* defines “Dangerous levels of lead-bearing substances” as any paint, varnish, lacquer, putty, plaster, or similar coating or structural material which contains lead or its compounds in excess of 0.7  $\text{mg}/\text{cm}^2$ , when measured by a lead-detecting instrument approved by the director; or any substance, when measured by any scientifically accepted method, in a quantity determined by the director to constitute a hazard to children; or that level as determined in the most recent standards as established by the U. S. Department of Health, Education and Welfare, Public Health Service, Center for Disease Control.
- *Title 8 CCR 1532.1*, the Cal/OSHA Lead in Construction Standard, establishes the requirements for worker protection. Elements covered by this standard include requirements associated with conducting trigger task activities (e.g. manual scraping, manual sanding), exposure monitoring, containments for lead-related tasks, training and certification, respiratory protection, medical surveillance, etc. Any trigger task performed on surfaces containing lead is covered by this regulation.
- *California CCR §5194, Hazard Communication Standard*, requires employers to notify their employees of hazardous material in their workplace.
- Lead waste is regulated under California Title 22, §66261.24. The standard defines lead hazardous waste as greater than 1,000  $\text{mg}/\text{kg}$  of lead and/or lead compounds determined as a Total Threshold Limit Concentration (TTLC) or 5.0 milligrams per liter ( $\text{mg}/\text{l}$ ) determined as a Soluble Threshold Limit Concentration (STLC).
- Federal EPA under the Resource Conservation and Recovery Act (RCRA) also mandates hazardous waste criteria for lead that is tested by the Toxicity Characteristic Leaching Procedure (TCLP). This method sets at limit for the quantity of lead that can be “soluble” or leach into the water. The EPA maximum toxicity characteristic for lead is equal to or greater than 5.0  $\text{mg}/\text{l}$ .



- SB 460 makes it illegal to create a lead hazard or to have a condition that is a lead hazard in residential and public buildings. Title 17 defines “lead hazard” as deteriorated lead-based paint, lead contaminated dust, lead contaminated soil, disturbing lead-based paint or presumed lead-based paint without containment, or any other nuisance which may result in persistent and quantifiable lead exposure.
- SB 460 also provides the California Department of Public Health (CDPH) and local enforcement agencies (including local building, housing, health, and environmental health agencies) the authority to issue orders to abate or otherwise correct a lead hazard. Enforcement agencies can also issue orders to cease and desist any activities that create lead hazards (such as disturbing lead based paint without using containment and failing to follow other lead safe work practices). SB 460 applies to persons engaged in performing:
  - remodeling and renovation work;
  - abatement of lead hazards; and
  - inspections and assessments of lead hazards.

## **FINDINGS**

### **Asbestos**

In total, HSA collected eight (8) suspect asbestos samples (17 analyses, by layer). None of the plaster or drywall materials sampled were determined to be either ACM/ACCM per the PLM method. A description of the materials sampled, estimated quantities, and their PLM asbestos analytical results are found in Table I.

### **Lead**

In total, HSA collected two bulk paint chips samples from this building. The sample that was collected from the Kitchen was the ceiling paint and the sample collected in the Exercise Room was from a wall area. The results identified the paint on the Kitchen ceiling at the north side of the damage as lead containing (greater than CPSC 0.009 WT%, but less than 0.5WT%). A description of the materials sampled and their analytical results are found in Table II. The paint sampling was performed for the purpose of contractor notification for OSHA compliance.

## **RECOMMENDATIONS**

LCP was identified on the Kitchen ceiling near the damaged area. It is HSA’s understanding that the damaged area is scheduled for repairs which will require impact of the LCP at some future date. All contractors performing lead related work at this location must be trained, at minimum,

Ms. Joleen Richardson, CSP  
HSA Project No.: 180081LA  
December 21, 2017  
Page 6

in lead safe work practices and perform their work pursuant to all appropriate regulations. Lead impacting project work should be monitored under the direction of a Certified Industrial Hygienist (CIH) who is also a Certified Lead Project Designer.

Care should be taken when performing any activities (e.g. manually dry sanding or scraping surfaces) to prepare the lead coated component(s) for repainting. Dust remaining from activities such as manual sanding and manual scraping may result in a *Lead Hazard* as described in Senate Bill 460 and the Code of California Regulations Title 17 (defined as deteriorated LBP, lead contaminated dust, lead contaminated soil, disturbing LBP or presumed LBP without containment, or any other nuisance which may result in persistent and quantifiable lead exposure).

Due to the age of the structure, hidden or unknown suspect ACM/ACCM, lead or other hazardous materials may be uncovered during renovation/maintenance activities. Therefore, all contractors working on the project should be informed of policies with regard to notifying the appropriate building owner/management personnel if previously unidentified suspect hazardous materials are discovered during the project.

For any questions or clarifications, we may be contacted by calling (714) 220-3922.

Prepared By



JanMarie Bailey  
Industrial Hygienist  
Field Admin Support

Reviewed By



Joel I. Berman, CIH, CSP, CAC, CIAQM,  
CDPH LST  
Vice President





**TABLE I - BULK ASBESTOS SAMPLING RESULTS**

**HSA Project No.:** 180081LA

**Project:** Fire Station 9, City of Long Beach, 3917 Long Beach Blvd., Long Beach, CA

**Date:** December 14, 2017

**Ind. Hyg.:** K. Cavalier/H. Dekeyan

Sample No.	Material	Location	Description	Asbestos Results Type and Percent (%)	Condition	Approximate Square/Linear footage
01A	Plaster	Kitchen	From ceiling at west side of damage	Skim Coat - ND Plaster - ND	Damaged	200 ft <sup>2</sup>
01B			From ceiling at west side of damage	Skim Coat - ND Plaster - ND		
01C			Above counter on north wall west of door	Skim Coat - ND Plaster - ND	Good	
01D		Captain's Office	Below window 2 at center of east wall	Skim Coat - ND Plaster - ND	Good	200 ft <sup>2</sup>
01E		Exercise Room	At base of wall in northeast corner	Texture - ND Skim Coat - ND Plaster - ND	Significant Damage	200 ft <sup>2</sup>
01F		2 <sup>nd</sup> Floor, Room 3	Under desk at north wall	Texture - ND Skim Coat - ND Plaster - ND	Good	60 ft <sup>2</sup>
01G		Engine Garage	Below Mod 2 at west side of south wall	Skim Coat - ND Plaster - ND	Good	400 ft <sup>2</sup>



**TABLE I - BULK ASBESTOS SAMPLING RESULTS Continued**

**HSA Project No.:** 180081LA

**Project:** Fire Station 9, City of Long Beach, 3917 Long Beach Blvd., Long Beach, CA

**Date:** December 14, 2017

**Ind. Hyg.:** K. Cavalier/H. Dekeyan

Sample No.	Material	Location	Description	Asbestos Results Type and Percent (%)	Condition	Approximate Square/Linear footage
02A	Drywall	Exercise Room	At base of wall in northeast corner	ND	Damaged	25 ft <sup>2</sup>
<b>Standards/Guidelines:</b>						
EPA - ACM						>1.0
State of California - ACCM						>0.1
<b>Analytical Method:</b> EPA 600/R-93/116 - Polarized Light Microscopy (PLM)						
<b>Abbreviations:</b> ND = none detected; < = less than; % - percent; EPA = Environmental Protection Agency; ACM = Asbestos Containing Material; ACCM = Asbestos Containing Construction Material; LF = linear feet; ft <sup>2</sup> = square feet; bold/shade = ACM; bold print only = ACCM						
<b>Disclaimer:</b> HSA's measurements and component identifications are approximations and <b>must be confirmed</b> by contractors bidding the project. In addition, hidden or unknown suspect asbestos containing materials (ACM)/asbestos containing construction materials (ACCM) or lead containing/coated materials may be uncovered during the project. Multiple layers of building materials exist, abatement includes all layers of both ACMs and non-ACMs including all residue. Similar materials in color, texture and appearance as those identified in HSA's report should be considered asbestos until sampled. All contractors working on the project should notify the Owner regarding the discovery of unidentified hazardous materials. All work to be performed in accordance with all state, local and federal regulations.						

## TABLE II - LEAD BASED PAINT RESULTS

**HSA Project No.:** 180081LA

**Project:** Fire Station 9  
City of Long Beach  
3917 Long Beach Blvd.  
Long Beach, CA

**Date:** December 14, 2017

**Ind. Hyg.:** K. Cavalier/H. Dekeyan

Sample Number	Location/Description	Laboratory Results Lead WT%
PC-01	Paint on kitchen ceiling at north side of damages	0.11
PC-02	Paint on base of north wall in Exercise Room at northeast corner	<0.010
<b>Standards/Guidelines</b>		
Consumer Products Safety Commission, August 2009		0.009
CDPH/HUD Guidelines, June, 1995		0.5
<b>Analytical Method:</b> EPA method 6010/EPA method 3050B/7000B		
<b>Abbreviations:</b> WT% = weight by percent; < = less than; LBP = Lead Based Paint; LCP = Lead Containing Paint; bold/shade = LBP; bold = LCP		

**APPENDIX A**  
**Laboratory Reports with Chain of Custody**





# LA Testing

5431 Industrial Drive Huntington Beach, CA 92649

Tel/Fax: (714) 828-4999 / (714) 828-4944

<http://www.LATesting.com> / [gardengrovelab@lateesting.com](mailto:gardengrovelab@lateesting.com)

LA Testing Order: 331724980

Customer ID: 32HEAL56

Customer PO:

Project ID:

**Attention:** Joel Berman  
Health Science Associates  
10771 Noel Street  
Los Alamitos, CA 90720

**Phone:** (714) 220-3922

**Fax:**

**Received Date:** 12/14/2017 9:25 AM

**Analysis Date:** 12/14/2017

**Collected Date:** 12/14/2017

**Project:** 180081LA / 3917 Long Beach Blvd., Fire Station #9, Long Beach, CA

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos % Type
			% Fibrous	% Non-Fibrous	
01A-Skim Coat 331724980-0001	Kitchen, ceiling, west side at damages - Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01A-Plaster 331724980-0001A	Kitchen, ceiling, west side at damages - Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01B-Skim Coat 331724980-0002	Kitchen, ceiling, west side at damages - Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01B-Plaster 331724980-0002A	Kitchen, ceiling, west side at damages - Plaster	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01C-Skim Coat 331724980-0003	Kitchen, north wall, west of door, above counter - Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01C-Plaster 331724980-0003A	Kitchen, north wall, west of door, above counter - Plaster	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01D-Skim Coat 331724980-0004 <i>Inseparable paint / coating layer included in analysis</i>	Capt. Office, east wall, center below window #2 - Plaster	White Non-Fibrous Heterogeneous		100% Non-fibrous (Other)	None Detected
01D-Plaster 331724980-0004A	Capt. Office, east wall, center below window #2 - Plaster	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02A 331724980-0005	Exercise door, north east corner, at base of wall - Drywall	Brown/White Fibrous Heterogeneous	6% Cellulose	70% Gypsum 24% Non-fibrous (Other)	None Detected
01E-Texture 331724980-0006 <i>Inseparable paint / coating layer included in analysis</i>	Exercise door, north east corner, at base of wall - Plaster	White Non-Fibrous Heterogeneous		100% Non-fibrous (Other)	None Detected
01E-Skim Coat 331724980-0006A	Exercise door, north east corner, at base of wall - Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01E-Plaster 331724980-0006B	Exercise door, north east corner, at base of wall - Plaster	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01F-Texture 331724980-0007 <i>Inseparable paint / coating layer included in analysis</i>	2nd Floor, room 3, north wall, below desk - Plaster	Gray/White Non-Fibrous Heterogeneous		100% Non-fibrous (Other)	None Detected
01F-Skim Coat 331724980-0007A	2nd Floor, room 3, north wall, below desk - Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01F-Plaster 331724980-0007B	2nd Floor, room 3, north wall, below desk - Plaster	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 12/14/2017 15:32:36



# LA Testing

5431 Industrial Drive Huntington Beach, CA 92649

Tel/Fax: (714) 828-4999 / (714) 828-4944

<http://www.LATesting.com> / [gardengrovelab@lateesting.com](mailto:gardengrovelab@lateesting.com)

LA Testing Order: 331724980

Customer ID: 32HEAL56

Customer PO:

Project ID:

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
01G-Skim Coat	Engine garage, south wall, west side below man 2 - Plaster	White Non-Fibrous Heterogeneous		100% Non-fibrous (Other)	None Detected
331724980-0008 <i>Inseparable paint / coating layer included in analysis</i>					
01G-Plaster	Engine garage, south wall, west side below man 2 - Plaster	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
331724980-0008A					

Analyst(s)

Mindy Le (17)

Michael DeCavallas, Laboratory Manager  
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by LA Testing Huntington Beach, CA NVLAP Lab Code 101384-0, CA ELAP 1406

Initial report from: 12/14/2017 15:32:36

**ASBESTOS BULK SAMPLE DATA SHEET**

<b>TAT</b>  <b>24 Hour</b>	<b>Project Manager:</b> Joel Berman	<b>Project #:</b> 180081LA	<b>Date:</b> 12/14/2017
	<b>Client:</b> City of Long Beach	<b>Industrial Hygienist:</b> Kirk Cavalier Hovaness Dekeyan	
	<b>Project Location:</b> 3917 Long Beach Blvd., Fire Station #9 Long Beach, CA		
<b>Comments:</b>			

Sample #	Material	Location/Description	Type (circle)	Condition	Quantity (ft <sup>2</sup> /lft)	Photograph #
01A	Plaster	Kitchen, Ceiling, <del>North</del> West side at damages	F TSI M SC NF	D SD G	200 ft <sup>2</sup>	1-3
01B	↓	↓	F TSI M SC NF	D SD G	↓	1-3
01C	↓	Kitchen, NORTH WALL, West of door, above counter	F TSI M SC NF	D SD G	200 ft <sup>2</sup>	4-5
01D	↓	Capit. of Rm, east wall, center below window #2	F TSI M SC NF	D SD G	200 ft <sup>2</sup>	6-7
02A	Drywall	Exercise Room, North East corner at base of wall	F TSI M SC NF	D SD G	25 ft <sup>2</sup>	8
01E	Plaster	↓	F TSI M SC NF	D SD G	200 ft <sup>2</sup>	8

Type: F = Friable; NF = Non-friable; TSI = Thermal System Insulation; M = Miscellaneous Material; SM = Surface Material; SC = Spray-on Coatings

Condition: D = Damaged (&lt; 10% surface damage); SD = Significantly Damaged (&gt; 10% surface damage); G = Good Condition

Labeling: W = Wall; F = Floor; T = TSI; C = Ceiling; O = Miscellaneous; R = Roofing

Quantity: ft<sup>2</sup> = square feet; lft = linear feet

**Special Instructions to Laboratory:**

Analyze per EPA 600 Method - PLM

Relinquished by: <i>[Signature]</i>	Date: 12/14/17	Time: 6:27	Received by: <i>[Signature]</i>	Date: 12/14/17	Time: 9:25
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:



**ASBESTOS BULK SAMPLE DATA SHEET**

<b>TAT</b>  <b>24 Hour</b>	<b>Project Manager:</b> Joel Berman	<b>Project #:</b> 180081LA	<b>Date:</b> 12/14/2017
	<b>Client:</b> City of Long Beach	<b>Industrial Hygienist:</b> Kirk Cavalier Hovaness Dekeyan	
	<b>Project Location:</b> 3917 Long Beach Blvd., Fire Station #9 Long Beach, CA	<b>Comments:</b>	

Sample #	Material	Location/Description	Type (circle)	Condition	Quantity (ft <sup>2</sup> /lft)	Photograph #
011F	Plaster	2nd floor, room 3, north wall, below desk	F NF M TSI SC SM	D SD G	60 ft <sup>2</sup>	9-11
016	↓	Engine Garage, south wall, west side below mod 2	F NF M TSI SC SM	D SD G	400 ft <sup>2</sup>	12-13
			F NF M TSI SC SM	D G SD		
			F NF M TSI SC SM	D G SD		
			F NF M TSI SC SM	D G SD		
			F NF M TSI SC SM	D G SD		

Type: F = Friable; NF = Non-friable; TSI = Thermal System Insulation; M = Miscellaneous Material; SM = Surface Material; SC = Spray-on Coatings

Condition: D = Damaged (&lt; 10% surface damage); SD = Significantly Damaged (&gt; 10% surface damage); G = Good Condition

Labeling: W = Wall; F = Floor; T = TSI; C = Ceiling; O = Miscellaneous; R = Roofing

Quantity: ft<sup>2</sup> = square feet; lft = linear feet

**Special Instructions to Laboratory:**

Analyze per EPA 600 Method - PLM

Relinquished by: [Signature]	Date: 12/14/17	Time: 0907	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:



## LA Testing

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[gardengrovelab@latesting.com](mailto:gardengrovelab@latesting.com)

LA Testing Order: 331724986

CustomerID: 32HEAL56

CustomerPO:

ProjectID:

Attn: **Lab results**  
**Health Science Associates**  
**10771 Noel Street**  
**Los Alamitos, CA 90720**

Phone: (714) 220-3922  
Fax:  
Received: 12/14/17 9:30 AM  
Collected: 12/14/2017

Project: **City of Long Beach, #180081LA, 3917 Long Beach Blvd., Fire Station #9, Long Beach, CA**

### Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)\*

<i>Client Sample Description</i>	<i>Collected</i>	<i>Analyzed</i>	<i>RDL</i>	<i>Lead Concentration</i>
PL01 331724986-0001	12/14/2017	12/14/2017 Site: Kitchen, ceiling, North side, at damaged	0.010 % wt	0.11 % wt
PL02 331724986-0002	12/14/2017	12/14/2017 Site: Exercise room, North East curve at base of wall	0.010 % wt	<0.010 % wt

Michael Chapman, Laboratory Manager  
or other approved signatory

\*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by LA Testing Huntington Beach, CA AIHA-LAP, LLC--ELLAP Accredited #101650, CA ELAP 1406

Initial report from 12/14/2017 19:33:15



**LEAD BULK SAMPLE DATA SHEET**

<b>TAT</b>  <b>24 Hour</b>	<b>Project Manager:</b> Joel Berman	<b>Project #:</b> 180081LA	<b>Date:</b> 12/14/2017
	<b>Client:</b> City of Long Beach	<b>Industrial Hygienist:</b> Kirk Cavalier	Hovaness Dekeyan
	<b>Project Location:</b> 3917 Long Beach Blvd., Fire Station #9 Long Beach, CA		
<b>Comments:</b>			

Sample #	Area (dimensions)	Media	Location / Description / XRF #	Notes / Instructions
P01	—	Paint chip ↓	Kitchen, ceiling, north side at damage	Lead ↓
P02	—		Exercise Room, north EBF corner at back of wall	

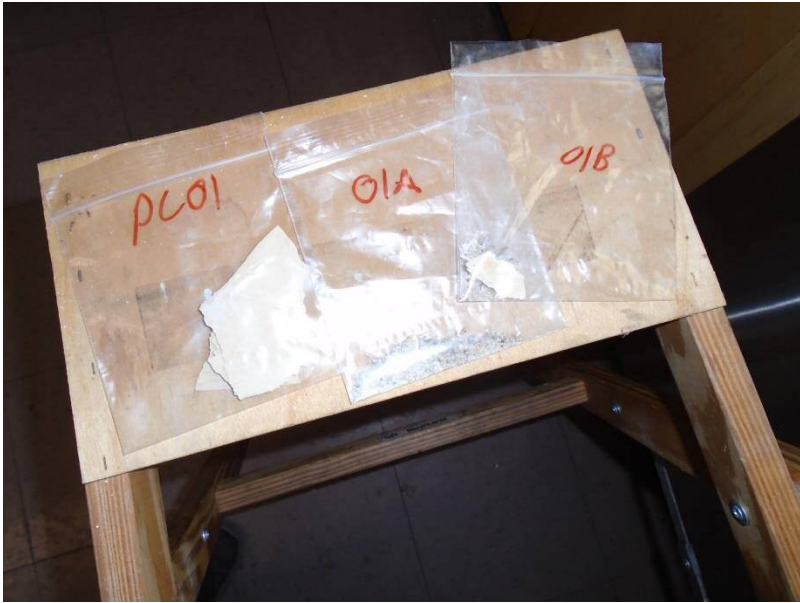
<b>Laboratory Reporting Units:</b>	Wipe in µg/ft <sup>2</sup>	Soil in ppm	<input checked="" type="checkbox"/> Paint Chip in WT %	<b>Analytical Method</b> <input checked="" type="checkbox"/> FAAS <input type="checkbox"/> ICP <input type="checkbox"/> GFAS
	Waste Water in ppm	Drinking Water in ppb	<input type="checkbox"/> Paint Chip in mg/cm <sup>2</sup>	
	Lead Waste in TTLC, STLC, TCLP (circle all that apply)			

**Special Instructions to Laboratory:**

Relinquished by: <i>Hco [Signature]</i>	Date: 12/14/17	Time: 0921	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

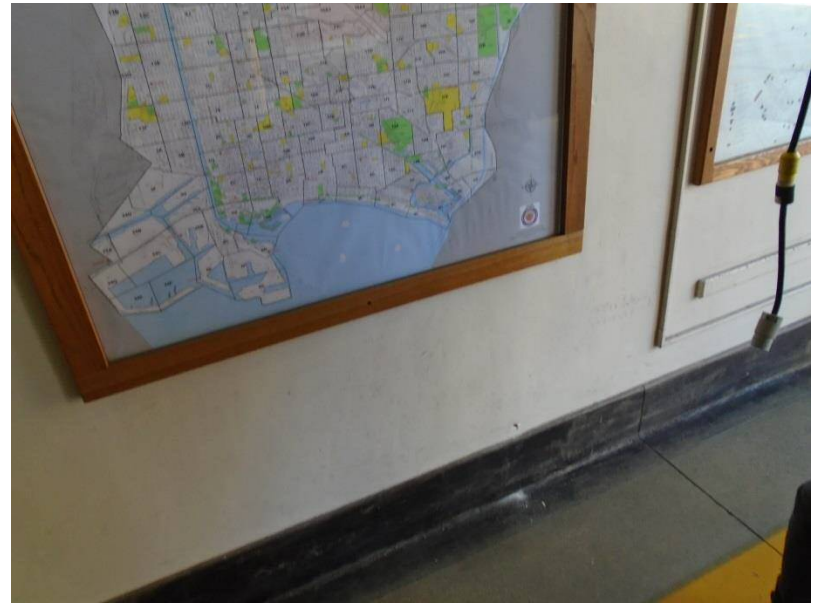
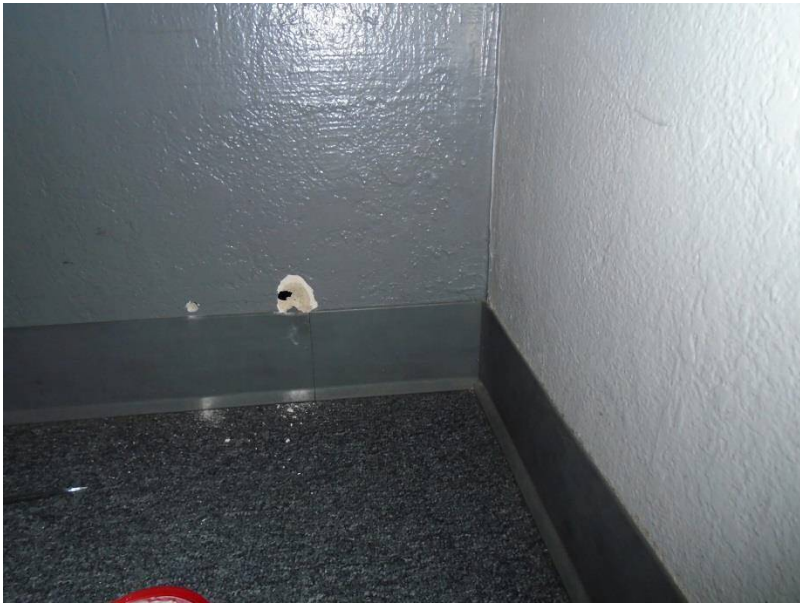
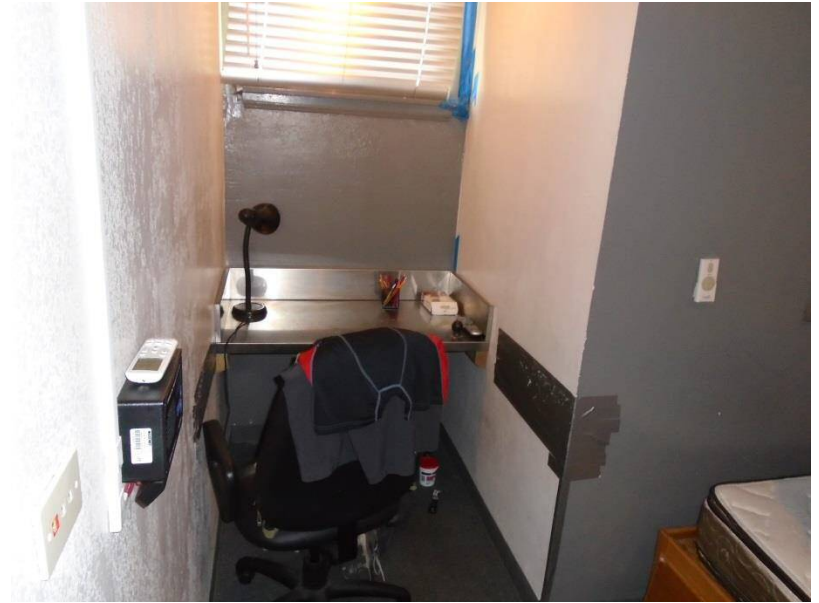


**APPENDIX B**  
**Photo Exhibit**





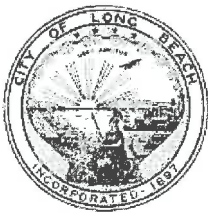






*Executive Summary: Results of the limited preliminary fungal investigation at Fire Station  
No. 9*





## City of Long Beach

Working Together to Serve

## Executive Summary

**Date:** December 27, 2017

**To:** David Honey, Manager of Administration, Fire Department

**From:** Joleen Richardson, CSP, City Safety Officer, Human Resources

**Subject:** **Results of the Limited preliminary fungal investigation at Fire Station 9**

Prior to July 2017, employees assigned to Fire Station 9 started reporting illnesses, which they felt were related to their workplace. The Occupational Health Clinic informed the City Safety Office of the influx of employees experiencing illnesses from Fire Station 9. In an effort to identify what the underlying condition was that may have been contributing to the illnesses, the City Safety Office hired a second Industrial Hygiene Company, Health Science Associates, to do additional sampling at Station 9.

On October 23, 2017, in accordance with the City Safety Office request, Health Science Associates (HSA) performed a job walk at Station 9 to determine where specific inspections should occur. The areas discussed included the areas that were affected by the rain storms of 2016-2017 and an area where the floor had collapsed. These areas are identified below:

- The crawlspace, especially under the shower area of the building (along the eastern portion of the building, floor collapse area).
- The kitchen ceiling area.
- The attic above the kitchen (this area is accessible through the attic access located in the second-floor women's bathroom/shower area).
- The under-stairwell storage closet.
- The northeast corner of the exercise room.
- The east wall of the captain's office (boroscope at the base of the wall).
- The south wall of the engine garage (boroscope at the base of the wall).
- The cupola on the roof, if possible.
- The movie room and a couple of the sleeping rooms on the second floor.
- The windows in the bedrooms of the second floor (boroscope at the base of the wall, rooms 1, 2, and 3).
- Ensure that clogged roof drains were cleaned (ask so that they may not need to be inspected).

In addition to the above areas of the building, during the inspection of the site, HSA determined that there was a heavy layer of dirt on various surfaces of the occupied areas of the building. This indicated that the cleaning of the building had missed various obvious surfaces, which had extremely heavy dust layers present. These areas included, but were not limited to, the wall mounted television (TV) supports, the tops of door jambs, and the tops of cabinets. Therefore, HSA was requested to prepare a deep cleaning protocol for the

building.

Additionally, during the job walk, HSA discovered that a return ductwork line, in the second floor attic space/mechanical area had been capped-off, but the ductwork was not collapsed. Therefore, it appeared that this ductwork is not completely sealed and is possibly drawing air into the heating, ventilation, and air conditioning (HVAC) system and distributing attic space air into the occupied spaces of the building.

### **Health Risks**

There are four primary health risks associated with fungal exposures. They are allergic reactions, irritation, toxicosis, and pathogens (i.e., cause disease). For more information on health risks, refer to the attached report pages 6-8.

### **Results and Observations**

On November 29, 2017, HSA performed a site investigation of the building. Total spore surface samples were collected using transparent adhesive Bio-tape to "trap" the spores and "lift" them from the test surface area for later laboratory analysis. Additionally, a boroscope, which is an optical device, was utilized to capture an image of the illuminated surface and to provide information on potential fungal growth in the area.

HSA staff could access the cupola, the attic space above the kitchen, various interior walls areas of the building, and various wall space/cavity areas using a boroscope.

Fungal growth or elevated levels of spores were found at almost all sampled locations. Listed below are the locations where fungal growth was found to be present based on the lab results, bolded items. The non-bolded locations are areas where elevated levels of spores were found, no identified growth structures. The picture number of the sampling locations is also included in parentheses. Not surprising, the kitchen ceiling and the exercise room northeast side area were determined to have active fungal growth.

1. Cupola, from 2 x 6 beam above cat walk at east wall (004).
2. Cupola, from louver of west vent (012).
3. Cupola, from dark spotty debris at east wall at vent (014 and 015).
4. **Attic Kitchen, suspect visible mold (057).**
5. From blanked off attic duct (059).
6. **Kitchen, suspect mold on ceiling (097).**
7. **Kitchen, suspect mold on ceiling (099).**
8. Exercise Room at return (106).
9. Exercise Room at supply (107).
10. **Exercise room from possible visible mold at northeast side (168).**

Additionally, the site investigation confirmed that most the areas of the building

have an elevated level of settled dust on various surfaces. The elevated levels of dust in the area were also evident when inspecting the filters that were installed in the wall mounted air condition units. The dust level that is present on the filters is visible in pictures 72-74 (11/29/17 site visit; see attached report), which were taken from the wall mounted AC unit in room #3, indicating that the filters have not been changed in an extended period.

There was one area where boroscope investigation identified the presence of suspect visible fungal growth inside of a wall cavity. This was in Room 3, north wall. Therefore, this area needs to be added to the further investigation and potentially remediation scope of work.

As far as the crawlspace is concerned, there was no visible growth in the inspected areas.

There is at least one additional issue related to the HVAC system of the station, which is the blanked-off return ductwork line that is present in the second floor attic space and mechanical area (picture 32 from the 10/23/17 job walk; see report). Therefore, this return ductwork line may or may not be a part of the operation of the overall HVAC system for the station and could indicate that the system is not operating properly, which could be related to some of the IAQ issues being experienced in the station.

As part of the October 23, 2017 job walk, it was identified that there was a hole in one of the engine exhaust vents for the station. This was verbally communicated at the time of the meeting (picture 81- 10/23/17; see report). The hole in the exhaust ductwork was still present during the November 29, 20-17 site visit (picture 186; see report).

### **Recommendations**

The following are HSA's as well as Risk Management's recommendations for this station:

- The entire station, including the cupola, should be thoroughly cleaned. This should be performed following the deep cleaning protocol prepared by HSA (See attached report, Appendix III).
- An evaluation of the entire HVAC system should be performed by an HVAC engineer to determine how the system is operating and if the blanked-off return ductwork line in the attic mechanical area has in any way compromised the system.
- The engine exhaust vent in the garage area needs to be repaired.
- The maintenance schedule related to the wall mounted AC units needs to be evaluated. Maintenance, including filter replacements should be performed pursuant to the requirements of the manufacturer.
- Fungal remediation in the following areas of the station needs to be

performed following the fungal remediation protocol that is included in Appendix IV (see attached report). The containments described in the remediation protocol are based on the medium sized areas of fungal growth pursuant to the New York Guidelines (<https://www1.nyc.gov/assets/doh/downloads/pdf/epi/epi-mold-guidelines.pdf>).

- a) The ceiling in the kitchen needs to have fungal remediation performed. The exact amount of ceiling that needs to be removed is approximately 40 square feet.
- b) The northeast wall section of the exercise room needs to be remediated. While the amount of visible fungal growth that was present on the room side of the wall in this area appeared to be small (less than one square foot), the amount of growth that could be present in the wall cavity is unknown. Therefore, HSA recommends that as a conservative approach, it should be assumed that the amount of growth at this location requires a medium containment.
- c) The north wall of room #3 needs to be further investigated and if fungal growth is present, then a remediation should be performed. If it is determined that an investigation should be performed first, then the remediation contractor who is performing the remediation in the kitchen and exercise rooms should perform this investigation using a glove bag to create a mini-containment and cut a 12 inch by 12 inch hole in the wall to determine whether the areas of visible suspect growth in this area are actually fungal growth or merely dust/dirt that appeared to be fungal growth through the boroscope.

CC: Alex Basquez, Director of Human Resources  
James Rexwinkel, Deputy Fire Chief  
Matt Gruneisen, Assistant Fire Chief  
Randall Sellers, Risk Manager  
Dana Anderson, Manager of Labor Relations  
Ray Toohey, Battalion Chief  
Kevin Burke, Safety Specialist III  
Ingrid Zubieta, Safety Specialist II

*Limited Post-Fungal Remediation Investigation*



TECHNICAL AND ADVISORY SERVICES • ENVIRONMENTAL HEALTH AND SAFETY

February 16, 2018

Ms. Joleen Richardson, CSP  
City of Long Beach  
Department of Human Resources  
333 West Ocean Blvd., 10th Floor  
Long Beach, CA 90802

Re: Limited post fungal remediation investigation of Long Beach Fire Department Station 9 located at 3917 Long Beach Blvd., Long Beach, CA performed January 19 and February 2, 2018; HSA Project Number 180117LA.

Dear Ms. Richardson:

At your request, Health Science Associates (HSA) performed a limited post fungal remediation investigation sampling at the above referenced location on January 19 and February 2, 2018. This project was performed by Howard J. Ozar, Certified Industrial Hygienist (CIH) with assistance provided by Frank Weitzel Jr., California Certified Site Surveillance Technician (CSST); California Department of Public Health (CDPH) Lead Inspector/Assessor (I/A) and Industrial Hygiene Technician. The project was performed under the direction of Joel I. Berman, CIH, Certified Safety Professional (CSP), Certified Asbestos Consultant (CAC), Certified Indoor Air Quality Manager (CIAQM), CDPH Lead Sampling Technician (LST), Vice President.

### **Background**

Previously, HSA confirmed the presence of fungal growth in two areas, the kitchen and the exercise room, of the subject fire station. In addition, HSA suspected that there was fungal growth present in a third area, room #3 on the second floor of the station (see the report for HSA Project Number 180034LA, dated December 13, 2017).

As a result of the previous HSA report, remediation of these areas was performed pursuant to our recommended fungal remediation guideline. This guideline was included as an Appendix in our report. Included in the recommended fungal remediation guideline, was post remediation air and surface sampling to document the efficacy of the remediation. This report documents the post remediation investigations performed by HSA.

### **Fungal Surface Sampling**

A visual inspection of the affected areas was performed prior to collecting fungal surface samples to determine if the remediated surfaces supported fungal growth and to confirm cleanliness of the area. This included a visual inspection and the black/white cloth tests. Once the area passed these inspections, sampling was performed.

The total spore surface samples were collected using transparent adhesive tape to "trap" the spores and "lift" them from the test surface for later laboratory analysis.

Tape surface samples provide a mechanism to evaluate general surface areas for total spore count. High total surface spore counts may be indicative of fungal contamination of the surfaces represented by the sample. Tape surface sampling also provides a mechanism to microscopically verify that visually suspect areas are clearly fungal growth rather than "dirt" that has a fungal-like



appearance, or vice versa. A total of ten total spore surface samples were collected on January 19, 2018 and three were collected on February 2, 2018. Additionally, one blank sample was submitted for quality control purposes with each set of samples. Their results are reported on Tables I and III -Total Spore Surface Sampling Results.

### **Fungal Air Sampling**

Sampling for airborne total mold spores was conducted to determine if the air concentrations inside of the containments were significantly different from outdoor air concentrations. The indoor/outdoor spore concentrations and hierarchies were compared and evaluated. A total of 12 total spore air samples were collected on January 19, 2018 and seven were collected on February 2, 2018. Additionally, one blank sample was submitted for quality control purposes with each set of samples. The results and sampling locations are recorded on Tables II and IV - Total Spore Air Sampling Results.

The air samples were collected using electrically powered high volume air sampling pumps. The air sampling trains were pre-calibrated using a field rotameter. The rotameter had been previously calibrated in the laboratory using the frictionless piston method, a primary standard, or a DC-Lite DryCal® near-frictionless piston primary standard.

After sample collection, the samples were transported via chain-of-custody procedures to LA Testing's Huntington Beach, CA laboratory for analysis. LA Testing is part of a larger, nationwide laboratory organization known as EMSL. These laboratories maintain accreditations by the American Industrial Hygiene Association (AIHA), the National Voluntary Laboratory Accreditation Program (NVLAP), the California Department of Public Health Environmental Laboratory Accreditation Program (ELAP), and AIHA's Environmental Lead Laboratory Accreditation Program (ELLAP).

The laboratory reports with chain of custody are located in Appendix A. The photographs that were taken which depict sampling locations are included in Appendix B.

### **Exclusions/Limitations**

HSA's scope of work did not include collection of samples for any other suspect hazardous materials (i.e. ground water samples, suspect mercury switches, PCBs, hidden wiring, etc.), which may have been utilized or installed at the building.

### **Fungal Sampling Results**

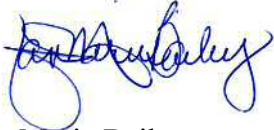
The surface and air samples collected in the Kitchen and Exercise Room containments on January 19, 2018 met HSA's post fungal remediation criterion. However, Room 3 failed these criteria and required additional cleaning.

The surface and air samples collected in Room 3 on February 2, 2018 were within the HSA post remediation criterion and therefore, fungal remediation is considered to be complete.

Ms. Joleen Richardson, CSP  
HSA Project No.: 180117LA  
February 16, 2018  
Page 3

For any questions or clarifications, we may be contacted by calling (714) 220-3922.

Prepared By



JanMarie Bailey  
Industrial Hygienist  
Admin Field Support

Reviewed By



Joel I. Berman, CIH, CSP, CAC, CIAQM,  
CDPH LST  
Vice President



## TABLE I - TOTAL SPORE SURFACE SAMPLING RESULTS

**Fire Station 9  
City of Long Beach  
3917 Long Beach Blvd  
Long Beach, CA**

**January 19, 2018**

Sample No.	Location	s/mm <sup>2</sup>	Spore Type (percentage)
18011913	Kitchen Containment: on backside of brown wallboard	1	Hyaline spores (100) - spores only
18011914	Kitchen Containment: on top of containment poly	2	Hyaline spores (100) - spores only
18011915	Kitchen Containment: on joist next to J-box	0	None Detected
18011916	Kitchen Containment: on floor	3	Hyaline spores (100) - spores only
18011917	Exercise Room Containment: on wall at baseboard height	3	Hyaline spores (100) - spores only
18011918	Exercise Room Containment: from black "smudge" on wall at 6" height	1	Hyaline spores (100) - spores only
18011919	Exercise Room Containment: on floor	0	None Detected
18011920	Room 3 Containment: on desk top	5	Cladosporium sp (50) - spores only Hyaline spores (50) - spores only
18011921	Room 3 Containment: on backside of wallboard under desk	38	Basidiospores (4) - spores only Chaetomium sp. (2) - spores only Cladosporium sp. (13) - spores only Hyaline spores (58) - spores only Myxomycete sp. (18) - spores only <b>Stachybotrys sp. (4) - spores only</b>
18011922	Room 3 Containment: on floor	2	Hyaline spores (100) - spores only
18011923	Field Blank	0	None Detected
Analytical Method: EMSL: MO41 (Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and other Particulates from Tape Samples)			
Professional Guidance		<10	No Toxigenic Spore Types
<b>Abbreviations:</b> s/mm <sup>2</sup> = spores per square millimeter; % - per cent			



**TABLE II - TOTAL SPORE AIR SAMPLING RESULTS**

**Fire Station 9  
City of Long Beach  
3917 Long Beach Blvd  
Long Beach, CA**

**January 19, 2018**

Sample No.:	18011901	18011902	18011903	18011904	18011905	18011906	18011907	18011908	18011909	18011910	18011911	18011912
Sample Location	Front (outdoors)	Outside Kitchen Containment	Kitchen Containment	Kitchen Containment	Outside Kitchen Containment	Back (outdoors)	Outside Exercise Containment	Exercise Containment	Outside Room 3 Containment	Room 3 Containment	Front (outdoors)	Field Blank
Time (min)	5	5	5	5	5	5	5	5	5	5	5	--
Air Volume (liters)	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	--
<b>Total Count/m<sup>3</sup></b>	<b>23,550</b>	<b>2,890</b>	<b>330</b>	<b>220</b>	<b>2,650</b>	<b>3,110</b>	<b>970</b>	<b>280</b>	<b>1,050</b>	<b>13,760</b>	<b>4,500</b>	<b>No Trace</b>
Alternaria	300	10*	--	--	--	10*	--	--	--	10*	--	--
Ascospores	510	--	10*	10*	80	80	--	--	--	--	100	--
Aspergillus/ Penicillium	6,920	200	200	--	400	460	300	200	460	<b>12,100</b>	300	--
Basidiospores	2,400	300	40	10*	100	970	80	--	40	100	630	--
Chaetomium	--	--	--	--	--	--	--	--	10*	40	--	--
Cladosporium	13,300	2,300	80	200	1,900	1,500	550	--	420	1,100	3,400	--
Curvularia	--	--	--	--	--	40	--	--	--	--	--	--
Epicoccum	10*	--	--	--	--	--	--	--	--	--	--	--
Myxomycetes++	40	80	--	--	80	40	40	--	80	200	40	--
Nigrospora	40	--	--	--	--	--	--	--	--	--	--	--
Polyschema	--	--	--	--	--	--	--	--	--	10*	--	--
Rust	--	--	--	--	10*	--	--	--	--	--	10*	--
Scopulariopsis	--	--	--	--	--	10*	--	--	--	--	--	--
Stachybotrys	--	--	--	--	80	--	--	80	40	<b>200</b>	10*	--



**TABLE II - TOTAL SPORE AIR SAMPLING RESULTS (CONT'D)**

**Fire Station 9  
City of Long Beach  
3917 Long Beach Blvd  
Long Beach, CA**

**January 19, 2018**

Sample No.:	18011901	18011902	18011903	18011904	18011905	18011906	18011907	18011908	18011909	18011910	18011911	18011912
Sample Location	Front (outdoors)	Outside Kitchen Containment	Kitchen Containment	Kitchen Containment	Outside Kitchen Containment	Back (outdoors)	Outside Exercise Containment	Exercise Containment	Outside Room 3 Containment	Room 3 Containment	Front (outdoors)	Field Blank
Stemphylium	--	--	--	--	--	--	--	--	--	--	10*	--
Ulocladium	30*	--	--	--	--	--	--	--	--	--	--	--
Hyphal Fragment	80	--	10*	--	--	40	40	10*	--	40	--	--
Insect Fragment	40	40	--	10*	--	--	--	--	--	40	--	--
Pollen	80	10*	10*	--	40	40	--	--	--	80	100	--

**Analytical Method:** Analysis of Fungal Spores & Particulates by Optical Microscopy - Method: EMSL 05-TP-003, ASTM D7391

**Abbreviations:** s/m<sup>3</sup> = spores per cubic meter of air; < = less than; \* = particles found at 300x

## TABLE III - TOTAL SPORE SURFACE SAMPLING RESULTS

**Fire Station 9  
City of Long Beach  
3917 Long Beach Blvd  
Long Beach, CA**

**February 2, 2018**

Sample No.	Location	s/m m <sup>2</sup>	Spore Type (percentage)
18020208	Room 3 Containment: on desk top	1	Hyaline spores (100) - spores only
18020209	Room 3 Containment: on floor	0	None Detected
18020210	Room 3 Containment: on joist	9	<i>Cladosporium sp.</i> (100) - spores only
18020211	Field Blank	0	None Detected
Analytical Method: EMSL: MO41 (Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and other Particulates from Tape Samples)			
Professional Guidance		<10	No Toxigenic Spore Types
<b>Abbreviations:</b> s/mm <sup>2</sup> = spores per square millimeter; % - per cent			





**TABLE IV - TOTAL SPORE AIR SAMPLING RESULTS**

**Fire Station 9  
City of Long Beach  
3917 Long Beach Blvd  
Long Beach, CA**

**February 2, 2018**

Sample No.:	18020201	18020202	18020203	18020204	18020205	18020206	18020207
Sample Location	Front (outdoors)	Outside room 3 Containment	Room 3 Containment	Room 3 Containment	Outside Room 3 Containment	Back (outdoors)	Field Blank
Time (min)	5	5	5	5	5	5	--
Air Volume (liters)	75.0	75.0	75.0	75.0	75.0	75.0	--
<b>Total Count/m<sup>3</sup></b>	<b>3,720</b>	<b>240</b>	<b>10</b>	<b>40</b>	<b>280</b>	<b>3,650</b>	<b>No Trace</b>
Alternaria	80					10	--
Ascospores	40						--
Aspergillus/ Penicillium	400				40	420	--
Basidiospores	680	80				680	--
Chaetomium							--
Cladosporium	2,400	80			200	2,400	--
Epicoccum			10			10	--
Myxomycetes++	80	80		40	40	80	--
Unidentified						40	--
Ulocladium						10	--
Hyphal Fragment	720	0	80	0	40	400	--
Insect Fragment		0	0	0	0	0	--
Pollen	420	10	40	10	0	590	--
<b>Analytical Method:</b> Analysis of Fungal Spores & Particulates by Optical Microscopy - Method: EMSL 05-TP-003, ASTM D7391							
<b>Abbreviations:</b> s/m <sup>3</sup> = spores per cubic meter of air; < = less than; * = particles found at 300x							

**APPENDIX A**  
**Laboratory Report and Chain of Custody**



# LA Testing

5431 Industrial Drive Huntington Beach, CA 92649  
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<http://www.LATesting.com> / [gardengrovelab@lateesting.com](mailto:gardengrovelab@lateesting.com)

Order ID: 331801612  
Customer ID: 32HEAL56  
Customer PO:  
Project ID:

**Attn:** Joel Berman  
Health Science Associates  
10771 Noel Street  
Los Alamitos, CA 90720

Phone: (714) 220-3922  
Fax:  
Collected: 01/19/2018  
Received: 01/19/2018  
Analyzed: 01/20/2018

**Proj:** 180117LA / City of LB - Fire Station #9 - Kitchen 3917 Long Beach Blvd., Long Beach, CA

## Test Report: Extended Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Tape Samples (EMSL Method: M041)

Lab Sample Number	Client Sample ID	Location	Fungal Identification	Category
331801612-0013	18011913	Kit cont b/s wallbrd brwn	Hyaline spores	100%
total spores per mm sq = 1				
331801612-0014	18011914	Kit cont top cont poly	Hyaline spores	100%
total spores per mm sq = 2				
331801612-0015	18011915	Kit cont joist nxt to jbox	None Detected	
total spores per mm sq = N/A				
331801612-0016	18011916	Kit cont floor	Hyaline spores	100%
total spores per mm sq = 3				
331801612-0017	18011917	Exer rm cont wall basebrd hght	Hyaline spores	100%
total spores per mm sq = 3				
331801612-0018	18011918	Exer rm cont wall blk smudge 6" hght	Hyaline spores	100%
total spores per mm sq = 1				
331801612-0019	18011919	Exer rm cont floor	None Detected	
total spores per mm sq = N/A				
331801612-0020	18011920	Rm #3 cont on desktop	Cladosporium sp.	50%
			Hyaline spores	50%
total spores per mm sq = 5				
331801612-0021	18011921	Rm #3 cont on wallbrd undr dsk b/s	Basidiospores	4%
			Chaetomium sp.	2%
			Cladosporium sp.	13%
			Hyaline spores	58%
			Myxomycete sp.	18%
			Stachybotrys sp.	4%
total spores per mm sq = 38				
331801612-0022	18011922	Rm #3 cont floor	Hyaline spores	100%
total spores per mm sq = 2				
331801612-0023	18011923	Field blank	None Detected	
total spores per mm sq = N/A				

Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut  
\* = Sample contains fruiting structures and/or hyphae associated with the spores.

Category	Count/area Analyzed
Rare	1 to 10
Low	11 to 100
Medium	101 to 1000
High	> 1000

Samples were received in good condition unless otherwise noted on this report.  
\* Sample contains fruiting structures and/or hyphae associated with the spores.

AIHA-LAP, LLC--EMLAP Accredited #101650

Initial report from: 01/22/2018 07:02:49

For Information on the fungi listed in this report please visit the Resources section at [www.emsl.com](http://www.emsl.com)

*Cecil Strait*

Cecil Strait, Micro Laboratory Manager  
or Other Approved Signatory



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**Phone:** (714) 220-3922

**Fax:**

**Collected:** 01/19/2018

**Received:** 01/19/2018

**Analyzed:** 01/20/2018

**Project:** 180117LA / City of LB - Fire Station #9 - Kitchen 3917 Long Beach Blvd., Long Beach, CA

## Test Report: Air-O-Cell™ Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L): Sample Location	331801612-0001 18011901 75 Front			331801612-0002 18011902 75 O/S kit cont			331801612-0003 18011903 75 Kit cont		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria	6	300	1.3	1*	10*	0.3	-	-	-
Ascospores	12	510	2.2	-	-	-	1*	10*	3
Aspergillus/Penicillium	164	6920	29.4	5	200	6.9	4	200	60.6
Basidiospores	56	2400	10.2	8	300	10.4	1	40	12.1
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	315	13300	56.5	54	2300	79.6	2	80	24.2
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	1*	10*	0	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1	40	0.2	2	80	2.8	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	2*	30*	0.1	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Nigrospora	1	40	0.2	-	-	-	-	-	-
Polyschema	-	-	-	-	-	-	-	-	-
Stemphylium	-	-	-	-	-	-	-	-	-
Total Fungi	558	23550	100	70	2890	100	8	330	100
Hyphal Fragment	2	80	-	-	-	-	1*	10*	-
Insect Fragment	1	40	-	1	40	-	-	-	-
Pollen	2	80	-	1*	10*	-	1*	10*	-
Analyt. Sensitivity 600x	-	42	-	-	42	-	-	42	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	2	-	-	1	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum  
Myxomycetes++ = Myxomycetes/Periconia/Smut

*Cecil Strait*

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. \*\*\* Denotes particles found at 300X. \* Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by LA Testing Huntington Beach, CA AIHA-LAP, LLC EMLAP 101650

Initial report from: 01/22/2018 07:02:49

For information on the fungi listed in this report, please visit the Resources section at [www.emsl.com](http://www.emsl.com)



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**Analyzed:** 01/20/2018

**Project:** 180117LA / City of LB - Fire Station #9 - Kitchen 3917 Long Beach Blvd., Long Beach, CA

## Test Report: Air-O-Cell™ Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L): Sample Location	331801612-0004 18011904 75 Kit cont			331801612-0005 18011905 75 O/S kit cont			331801612-0006 18011906 75 Back		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria	-	-	-	-	-	-	1*	10*	0.3
Ascospores	1*	10*	4.5	2	80	3	2	80	2.6
Aspergillus/Penicillium	-	-	-	9	400	15.1	11	460	14.8
Basidiospores	1*	10*	4.5	3	100	3.8	23	970	31.2
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	4	200	90.9	44	1900	71.7	35	1500	48.2
Curvularia	-	-	-	-	-	-	1	40	1.3
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	2	80	3	1	40	1.3
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	1*	10*	0.4	-	-	-
Scopulariopsis	-	-	-	-	-	-	1*	10*	0.3
Stachybotrys	-	-	-	2	80	3	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Polyschema	-	-	-	-	-	-	-	-	-
Stemphylium	-	-	-	-	-	-	-	-	-
Total Fungi	6	220	100	63	2650	100	75	3110	100
Hyphal Fragment	-	-	-	-	-	-	1	40	-
Insect Fragment	1*	10*	-	-	-	-	-	-	-
Pollen	-	-	-	1	40	-	1	40	-
Analyt. Sensitivity 600x	-	42	-	-	42	-	-	42	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	1	-
Fibrous Particulate (1-4)	-	2	-	-	2	-	-	1	-
Background (1-5)	-	1	-	-	2	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum  
Myxomycetes++ = Myxomycetes/Periconia/Smut

*Cecil Strait*

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Initial report from: 01/22/2018 07:02:49

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**Analyzed:** 01/20/2018

**Project:** 180117LA / City of LB - Fire Station #9 - Kitchen 3917 Long Beach Blvd., Long Beach, CA

## Test Report: Air-O-Cell™ Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L): Sample Location	331801612-0007 18011907 75 O/S exer cont			331801612-0008 18011908 75 Exer cont			331801612-0009 18011909 75 O/S rm #3 cont		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	6	300	30.9	5	200	71.4	11	460	43.8
Basidiospores	2	80	8.2	-	-	-	1	40	3.8
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	1*	10*	1
Cladosporium	13	550	56.7	-	-	-	10	420	40
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1	40	4.1	-	-	-	2	80	7.6
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	2	80	28.6	1	40	3.8
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Polyschema	-	-	-	-	-	-	-	-	-
Stemphylium	-	-	-	-	-	-	-	-	-
Total Fungi	22	970	100	7	280	100	26	1050	100
Hyphal Fragment	1	40	-	1*	10*	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	42	-	-	42	-	-	42	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	1	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum  
Myxomycetes++ = Myxomycetes/Periconia/Smut

*Cecil Strait*

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**Project:** 180117LA / City of LB - Fire Station #9 - Kitchen 3917 Long Beach Blvd., Long Beach, CA

## Test Report: Air-O-Cell™ Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L): Sample Location	331801612-0010 18011910 75 Rm #3 cont			331801612-0011 18011911 75 Front			331801612-0012 18011912 Field blank		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria	1*	10*	0.1	-	-	-	-	-	-
Ascospores	-	-	-	3	100	2.2	-	-	-
Aspergillus/Penicillium	287	12100	87.9	6	300	6.7	-	-	-
Basidiospores	3	100	0.7	15	630	14	-	-	-
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	1	40	0.3	-	-	-	-	-	-
Cladosporium	26	1100	8	80	3400	75.6	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	5	200	1.5	1	40	0.9	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	1*	10*	0.2	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	4	200	1.5	1*	10*	0.2	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Polyschema	1*	10*	0.1	-	-	-	-	-	-
Stemphylium	-	-	-	1*	10*	0.2	-	-	-
<b>Total Fungi</b>	<b>328</b>	<b>13760</b>	<b>100</b>	<b>108</b>	<b>4500</b>	<b>100</b>	<b>No Trace</b>		
Hyphal Fragment	1	40	-	-	-	-	-	-	-
Insect Fragment	1	40	-	-	-	-	-	-	-
Pollen	2	80	-	3	100	-	-	-	-
Analyt. Sensitivity 600x	-	42	-	-	42	-	-	0	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	0*	-
Skin Fragments (1-4)	-	2	-	-	1	-	-	-	-
Fibrous Particulate (1-4)	-	2	-	-	1	-	-	-	-
Background (1-5)	-	2	-	-	2	-	-	-	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum  
Myxomycetes++ = Myxomycetes/Periconia/Smut

*Cecil Strait*

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. \*\*\* Denotes particles found at 300X. "\*" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by LA Testing Huntington Beach, CA AIHA-LAP, LLC EMLAP 101650

Initial report from: 01/22/2018 07:02:49

For information on the fungi listed in this report, please visit the Resources section at [www.emsl.com](http://www.emsl.com)

**BULK AIR SAMPLING DATA SHEET**

TAT  24 Hour	<b>Project Manager:</b>	Joel Berman	<b>Project #:</b>	180117LA	<b>Date:</b>	11/19/18
	<b>Client:</b>	City of LB-Fire Station #9-Kitchen	<b>Industrial Hygienist:</b>	Joel Berman	Frankie Weitzer	
	<b>Project Location:</b>	3917 Long Beach Blvd. Long Beach, CA	<b>Airflow Calibrator</b>	<b>Make:</b> Pwyer	<b>Model:</b>	
			<b>Serial #:</b>	000547	<b>Expiration:</b>	5/3/18
<input type="checkbox"/> IAQ		<input type="checkbox"/> Compliance		<input checked="" type="checkbox"/> Routine Inspection		<input type="checkbox"/> Background

Sample #	Sample Collection (Summa canister, Tedlar bag)	Analysis Method Requested	Summa Canister		Tedlar bag		Time			Total Volume (L)	Location/Description/Remarks
			Negative Pressure (psi)		Flow Rate (L/min)		Start	Stop	Total (min)		
			Pre	Post	Pre	Post					
18011901	Air-O-Cell	M001			15.0		0850	0855	5	75.0	Front
					Avg:						
18011902	Air-O-Cell	M001			15.0		0910	0915	5	75.0	Outside Kitchen Containment
					Avg:						
18011903	Air-O-Cell	M001			15.0		0920	0925	5	75.0	Kitchen Containment
					Avg:						
18011904	Air-O-Cell	M001			15.0		0930	0935	5	75.0	Kitchen Containment
					Avg:						
18011905	Air-O-Cell	M001			15.0		1000	1005	5	75.0	Outside Kitchen Containment
					Avg:						
18011906	Air-O-Cell	M001			15.0		1020	1025	5	75.0	Back
					Avg:						
18011907	Air-O-Cell	M001			15.0		1045	1050	5	75.0	Outside Exercise Containment
					Avg:						

Special Instructions to Laboratory:

Relinquished by: <i>James On</i>	Date: 1/19/18	Time: 1450	Received by: <i>POW</i>	Date: 1-19-18	Time: 1450
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

**BULK AIR SAMPLING DATA SHEET**

<b>TAT</b>  <b>24 Hour</b>	<b>Project Manager:</b>	Joel Berman	<b>Project #:</b>	180117LA	<b>Date:</b>	11/19/18
	<b>Client:</b>	City of LB-Fire Station #9-Kitchen	<b>Industrial Hygienist:</b>	Joel Berman	Frankie Weitzel	
	<b>Project Location:</b>	3917 Long Beach Blvd. Long Beach, CA	<b>Airflow Calibrator</b>	<b>Make:</b> Dwyer	<b>Model:</b>	
			<b>Serial #:</b> 000547	<b>Expiration:</b> 5/3/18		

☐ IAQ
 ☐ Compliance
 ☒ Routine Inspection
 ☐ Background

Sample #	Sample Collection (Summa canister, Tedlar bag)	Analysis Method Requested	Summa Canister		Tedlar bag		Time			Total Volume (L)	Location/Description/Remarks
			Negative Pressure (psi)		Flow Rate (L/min)		Start	Stop	Total (min)		
			Pre	Post	Pre	Post					
18011908	Air-O-Cell	M001			15.0		1055	1100	5	75.0	Exercise Containment
					Avg:						
18011909	Air-O-Cell	M001			15.0		1110	1115	5	75.0	outside Room #3 Containment
					Avg:						
18011910	Air-O-Cell	M001			15.0		1116	1121	5	75.0	Room #3 Containment
					Avg:						
18011911	Air-O-Cell	M001			15.0		1130	1135	5	75.0	Front
					Avg:						
18011912	Air-O-Cell	M001									Field Blank
					Avg:						
	Air-O-Cell	M001									
					Avg:						
	Air-O-Cell	M001									
					Avg:						

Special Instructions to Laboratory:

Relinquished by: <i>Glowacki</i>	Date: 11/19/18	Time: 1950	Received by: <i>ngw</i>	Date: 1-19-18	Time: 1450
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

**SURFACE SAMPLING DATA SHEET**

<b>TAT</b>  <b>24 Hour</b>	<b>Project Manager:</b>	Joel Berman	<b>Project #:</b>	180117LA	<b>Date:</b>	12/14/2017
	<b>Client:</b>	City of LB-Fire Station #9-Kitchen	<b>Industrial Hygienist:</b>	Joel Berman	Frankie Weitzer	
	<b>Project Location:</b>	3917 Long Beach Blvd. Long Beach, CA	<b>Comments:</b>			

☐ IAQ
 ☐ OSHA Compliance
 ☒ Abatement/Clearance
 ☐ Routine Inspection
 ☐ Background

Sample #	Sample Type	Analysis Method Requested	Location/Description/Remarks
18011913	Tape Lift	M170	Kitchen Containment Backside, wallboard, Brown
18011914	Tape Lift	M170	Kitchen Containment Top, Containment Poly
18011915	Tape Lift	M170	Kitchen Containment Joist, next to J-Box
18011916	Tape Lift	M170	Kitchen Containment Floor
18011917	Tape Lift	M170	Exercise Room Containment Wall, Baseboard Height
18011918	Tape Lift	M170	Exercise Room Containment Wall, Black Smudge, 6" Height
18011919	Tape Lift	M170	Exercise Room Containment Floor
	Tape Lift	M170	

Special Instructions to Laboratory:

Relinquished by: <i>Joel Berman</i>	Date: 1/14/18	Time: 1750	Received by: <i>new</i>	Date: 1-14-18	Time: 1950
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

171  
24hr

10770 Noel Street • Los Alamitos, CA 90720

Office: (714) 220-3922 • Fax: (714) 220-2081

Page 2 of 2

Surface  
Samples

Tape Lift

#331801612

## MOISTURE METER DATA SHEET

<b>Project Manager:</b>	Joel Berman	<b>Project #:</b>	180117LA
<b>Client:</b>	City of LB-Fire Station #9-Kitchen	<b>Date:</b>	12/14/2017 1/19/18
<b>Project Location:</b>	3917 Long Beach Blvd. Long Beach, CA	<b>Industrial Hygienist:</b>	Joel Berman Frankie Weitzel
<b>Moisture Meter</b>	<b>Make:</b>	<b>Model:</b>	<b>Serial #:</b>

General Location	Specific Location	Substrate	Height	% Moisture	Comments / Observations
18011920	Tape Lift	M170	—	—	Room #3 Containment on Desk Top
18011921	Tape Lift	M170	—	—	Room #3 Containment on Wall Board under desk Backside
18011922	Tape Lift	M170	—	—	Room #3 Containment Floor
18011923	Tape Lift	M170	—	—	Field Blank
Relinquished By:					
Newweel	1/19/18	1450			Rec'd By W 1-17-18 1450



# LA Testing

5431 Industrial Drive Huntington Beach, CA 92649  
Phone/Fax: (714) 828-4999 / (714) 828-4944  
<http://www.LATesting.com> / [gardengrovelab@lateesting.com](mailto:gardengrovelab@lateesting.com)

Order ID: 331802950  
Customer ID: 32HEAL56  
Customer PO:  
Project ID:

**Attn:** Joel Berman  
Health Science Associates  
10771 Noel Street  
Los Alamitos, CA 90720

**Phone:** (714) 220-3922  
**Fax:**  
**Collected:** 02/02/2018  
**Received:** 02/02/2018  
**Analyzed:** 02/05/2018

**Proj:** 180117LA/ City of Long Beach Fire Station #9/ 3917 Long Beach Blvd. Long Beach, CA 90807

## Test Report: Extended Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Tape Samples (EMSL Method: M041)

Lab Sample Number	Client Sample ID	Location	Fungal Identification	Category
331802950-0008	18020208	Containment room 3, desk	Hyaline spores	100%
Total spores per mm sq.= 1				
331802950-0009	18020209	Containment room 3, floor	None Detected	
Total spores per mm sq.= NA				
331802950-0010	18020210	Containment room 3, joist	Cladosporium sp.	100%
Total spores per mm sq.= 9				
331802950-0011	18020211	Field blank	None Detected	
Total spores per mm sq.= NA				

Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut  
\* = Sample contains fruiting structures and/or hyphae associated with the spores.

Category	Count/area Analyzed
Rare	1 to 10
Low	11 to 100
Medium	101 to 1000
High	> 1000

Samples were received in good condition unless otherwise noted on this report.  
\* Sample contains fruiting structures and/or hyphae associated with the spores.

AIHA-LAP, LLC--EMLAP Accredited #101650

Cecil Strait, Micro Laboratory Manager  
or Other Approved Signatory

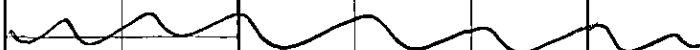
Initial report from: 02/05/2018 10:42:13

For Information on the fungi listed in this report please visit the Resources section at [www.emsl.com](http://www.emsl.com)



# AIR SAMPLING DATA SHEET

TAT  24 Hour	<b>Project Manager:</b> Joel Berman		<b>Project #:</b> 180117LA		<b>Date:</b> 2/2/2018	
	<b>Client:</b> City of Long Beach Fire Station #9		<b>Industrial Hygienist:</b> Howard Ozar			
	<b>Project Location:</b> 3917 Long Beach Blvd. Long Beach, CA 90807		<b>Airflow Calibrator</b>		<b>HSA #:</b> 547 (0-20)	<b>Exp:</b> 5/3/2018
					<b>HSA #:</b>	<b>Exp:</b>
<input type="checkbox"/> IAQ <input type="checkbox"/> OSHA Compliance <input checked="" type="checkbox"/> Abatement/Clearance <input type="checkbox"/> Routine Inspection <input type="checkbox"/> Background						

Sample #	Sample Media Type (filter, tube, badge)	Analysis Method Requested	Flow Rate (L/min)		Time			Total Volume (L)	Location/Description/Remarks
			Pre	Post	Start	Stop	Total (min)		
18020201	Air-O-cell ↓	M001 ↓	15.0		0840	0845	5	75.0	Front
			Avg:						
15.0				0850	0855	5	75.0	Outside Containment Room 3	
Avg:									
15.0				0900	0905	5	75.0	Containment Room 3	
Avg:									
15.0				0910	0915	5	75.0	Containment Room 3	
Avg:									
18020205			15.0		0925	0930	5	75.0	Outside Containment Room 3
			Avg:						
18020206			15.0		0935	0940	5	75.0	Back
			Avg:						
18020207									Field Blank
			Avg:						
			Avg:						

## Special Instructions to Laboratory:

Relinquished by: <i>Howard Ozar</i>	Date: 2/2/18	Time: 11:05	Received by: <i>[Signature]</i>	Date: 2/2/2018	Time: 10:05a
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

**SURFACE SAMPLING DATA SHEET**

<b>TAT</b>  <b>24 Hour</b>	<b>Project Manager:</b> Joel Berman	<b>Project #:</b> 180117LA	<b>Date:</b> 2/2/2018
	<b>Client:</b> City of Long Beach Fire Station #9	<b>Industrial Hygienist:</b> Howard Ozar	
	<b>Project Location:</b> 3917 Long Beach Blvd. Long Beach, CA 90807	<b>Comments:</b>	
<input type="checkbox"/> IAQ <input type="checkbox"/> OSHA Compliance <input checked="" type="checkbox"/> Abatement/Clearance <input type="checkbox"/> Routine Inspection <input type="checkbox"/> Background			

Sample #	Sample Type	Analysis Method Requested	Location/Description/Remarks
18020208	Tape Lift	M170	Containment, Room 3, Desk
18020209			Containment, Room 3, Floor
18020210			Containment, Room 3, Joist
18020211			Field Blank

**Special Instructions to Laboratory:**

Relinquished by: <i>Howard Ozar</i>	Date: 2/2/18	Time: 1105	Received by: <i>[Signature]</i>	Date: 2/2/2018	Time: 11:05
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:



# LA Testing

5431 Industrial Drive Huntington Beach, CA 92649

Tel/Fax: (714) 828-4999 / (714) 828-4944

<http://www.LATesting.com> / [gardengrovelab@lateesting.com](mailto:gardengrovelab@lateesting.com)

LA Testing Order: 331802950

Customer ID: 32HEAL56

Customer PO:

Project ID:

**Attn:** Joel Berman  
Health Science Associates  
10771 Noel Street  
Los Alamitos, CA 90720

**Phone:** (714) 220-3922

**Fax:**

**Collected:** 02/02/2018

**Received:** 02/02/2018

**Analyzed:** 02/05/2018

**Project:** 180117LA/ City of Long Beach Fire Station #9/ 3917 Long Beach Blvd. Long Beach, CA 90807

## Test Report: Air-O-Cell™ Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L): Sample Location	331802950-0001 18020201 75 Front			331802950-0002 18020202 75 Outside containment room 3			331802950-0003 18020203 75 Containment room 3		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria	2	80	2.2	-	-	-	-	-	-
Ascospores	1	40	1.1	-	-	-	-	-	-
Aspergillus/Penicillium	9	400	10.8	-	-	-	-	-	-
Basidiospores	16	680	18.3	2	80	33.3	-	-	-
Bipolaris++	1	40	1.1	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	58	2400	64.5	2	80	33.3	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	1*	10*	100
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	2	80	2.2	2	80	33.3	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	89	3720	100	6	240	100	1	10	100
Hyphal Fragment	17	720	-	-	-	-	2	80	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	10	420	-	1*	10*	-	1	40	-
Analyt. Sensitivity 600x	-	42	-	-	42	-	-	42	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	2	-	-	1	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum  
Myxomycetes++ = Myxomycetes/Periconia/Smut

**Preliminary Report**

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. \*\*\* Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by LA Testing Huntington Beach, CA AIHA-LAP, LLC EMLAP 101650

Initial report from: 12/31/1899 00:00:00

For information on the fungi listed in this report, please visit the Resources section at [www.emsl.com](http://www.emsl.com)



# LA Testing

5431 Industrial Drive Huntington Beach, CA 92649

Tel/Fax: (714) 828-4999 / (714) 828-4944

<http://www.LATesting.com> / [gardengrovelab@latesting.com](mailto:gardengrovelab@latesting.com)

LA Testing Order: 331802950

Customer ID: 32HEAL56

Customer PO:

Project ID:

**Attn:** Joel Berman  
Health Science Associates  
10771 Noel Street  
Los Alamitos, CA 90720

**Phone:** (714) 220-3922

**Fax:**

**Collected:** 02/02/2018

**Received:** 02/02/2018

**Analyzed:** 02/05/2018

**Project:** 180117LA/ City of Long Beach Fire Station #9/ 3917 Long Beach Blvd. Long Beach, CA 90807

## Test Report: Air-O-Cell™ Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L): Sample Location	331802950-0004 18020204 75 Containment room 3			331802950-0005 18020205 75 Outside containment room 3			331802950-0006 18020206 75 Back		
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total
Alternaria	-	-	-	-	-	-	1*	10*	0.3
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	1	40	14.3	10	420	11.5
Basidiospores	-	-	-	-	-	-	16	680	18.6
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	4	200	71.4	56	2400	65.8
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	1*	10*	0.3
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1	40	100	1	40	14.3	2	80	2.2
Pithomyces	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	1*	10*	0.3
Unidentifiable Spores	-	-	-	-	-	-	1	40	1.1
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	1	40	100	6	280	100	88	3650	100
Hyphal Fragment	-	-	-	1	40	-	9	400	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	1*	10*	-	-	-	-	14	590	-
Analyt. Sensitivity 600x	-	42	-	-	42	-	-	42	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	2	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum  
Myxomycetes++ = Myxomycetes/Periconia/Smut

**Preliminary Report**

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. \*\*\* Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by LA Testing Huntington Beach, CA AIHA-LAP, LLC EMLAP 101650

Initial report from: 12/31/1899 00:00:00

For information on the fungi listed in this report, please visit the Resources section at [www.emsl.com](http://www.emsl.com)



# LA Testing

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<http://www.LATesting.com> / [gardengrovelab@lateesting.com](mailto:gardengrovelab@lateesting.com)

LA Testing Order: 331802950

Customer ID: 32HEAL56

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Project ID:

**Attn:** Joel Berman  
Health Science Associates  
10771 Noel Street  
Los Alamitos, CA 90720

**Phone:** (714) 220-3922

**Fax:**

**Collected:** 02/02/2018

**Received:** 02/02/2018

**Analyzed:** 02/05/2018

**Project:** 180117LA/ City of Long Beach Fire Station #9/ 3917 Long Beach Blvd. Long Beach, CA 90807

## Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods EMSL 05-TP-003, ASTM D7391)

<b>Lab Sample Number:</b>	331802950-0007						
<b>Client Sample ID:</b>	18020207						
<b>Volume (L):</b>							
<b>Sample Location</b>	Field blank						
<b>Spore Types</b>	<b>Raw Count</b>	<b>Count/m³</b>	<b>% of Total</b>				
Alternaria	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-	-	-
Basidiospores	-	-	-	-	-	-	-
Bipolaris++	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-
Scopulariopsis	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-
<b>Total Fungi</b>	-	<b>No Trace</b>	-	-	-	-	-
Hyphal Fragment	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	0	-	-	-	-	-
Analyt. Sensitivity 300x	-	0*	-	-	-	-	-
Skin Fragments (1-4)	-	-	-	-	-	-	-
Fibrous Particulate (1-4)	-	-	-	-	-	-	-
Background (1-5)	-	-	-	-	-	-	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum  
Myxomycetes++ = Myxomycetes/Periconia/Smut

**Preliminary Report**

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. \*\*\* Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

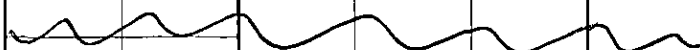
Samples analyzed by LA Testing Huntington Beach, CA AIHA-LAP, LLC EMLAP 101650

Initial report from: 12/31/1899 00:00:00

For information on the fungi listed in this report, please visit the Resources section at [www.emsl.com](http://www.emsl.com)

# AIR SAMPLING DATA SHEET

TAT  24 Hour	<b>Project Manager:</b> Joel Berman		<b>Project #:</b> 180117LA		<b>Date:</b> 2/2/2018	
	<b>Client:</b> City of Long Beach Fire Station #9		<b>Industrial Hygienist:</b> Howard Ozar			
	<b>Project Location:</b> 3917 Long Beach Blvd. Long Beach, CA 90807		<b>Airflow Calibrator</b>		<b>HSA #:</b> 547 (0-20)	<b>Exp:</b> 5/3/2018
					<b>HSA #:</b>	<b>Exp:</b>
<input type="checkbox"/> IAQ <input type="checkbox"/> OSHA Compliance <input checked="" type="checkbox"/> Abatement/Clearance <input type="checkbox"/> Routine Inspection <input type="checkbox"/> Background						

Sample #	Sample Media Type (filter, tube, badge)	Analysis Method Requested	Flow Rate (L/min)		Time			Total Volume (L)	Location/Description/Remarks
			Pre	Post	Start	Stop	Total (min)		
18020201	Air-O-cell ↓	M001 ↓	15.0		0840	0845	5	75.0	Front
			Avg:						
15.0				0850	0855	5	75.0	Outside Containment Room 3	
Avg:									
15.0				0900	0905	5	75.0	Containment Room 3	
Avg:									
15.0				0910	0915	5	75.0	Containment Room 3	
Avg:									
18020205			15.0		0925	0930	5	75.0	Outside Containment Room 3
			Avg:						
18020206			15.0		0935	0940	5	75.0	Back
			Avg:						
18020207									Field Blank
			Avg:						
			Avg:						

## Special Instructions to Laboratory:

Relinquished by: <i>Howard Ozar</i>	Date: 2/2/18	Time: 11:05	Received by: <i>[Signature]</i>	Date: 2/2/2018	Time: 10:05a
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:



**SURFACE SAMPLING DATA SHEET**

<b>TAT</b>  <b>24 Hour</b>	<b>Project Manager:</b>	Joel Berman	<b>Project #:</b>	180117LA	<b>Date:</b>	2/2/2018
	<b>Client:</b>	City of Long Beach Fire Station #9	<b>Industrial Hygienist:</b> Howard Ozar			
	<b>Project Location:</b>	3917 Long Beach Blvd. Long Beach, CA 90807	<b>Comments:</b>			
<input type="checkbox"/> IAQ <input type="checkbox"/> OSHA Compliance <input checked="" type="checkbox"/> Abatement/Clearance <input type="checkbox"/> Routine Inspection <input type="checkbox"/> Background						

Sample #	Sample Type	Analysis Method Requested	Location/Description/Remarks
18020208	Tape Lift	M170	Containment, Room 3, Desk
18020209			Containment, Room 3, Floor
18020210			Containment, Room 3, Joist
18020211			Field Blank

**Special Instructions to Laboratory:**

Relinquished by: <i>Howard Ozar</i>	Date: 2/2/18	Time: 1105	Received by: <i>[Signature]</i>	Date: 2/2/2018	Time: 11:05
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

## **APPENDIX B**

### **Photographs**

City of Long Beach-Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, CA

Post Remediation Survey – HSA Project Number 180117LA

January 19, 2018



Pic 001\_r-Outside front



Pic 002\_r



Pic 003\_r-Outside kitchen containment



Pic 004\_r



Pic 005\_r



Pic 006\_r



Pic 007\_r-Inside kitchen containment



Pic 008\_r

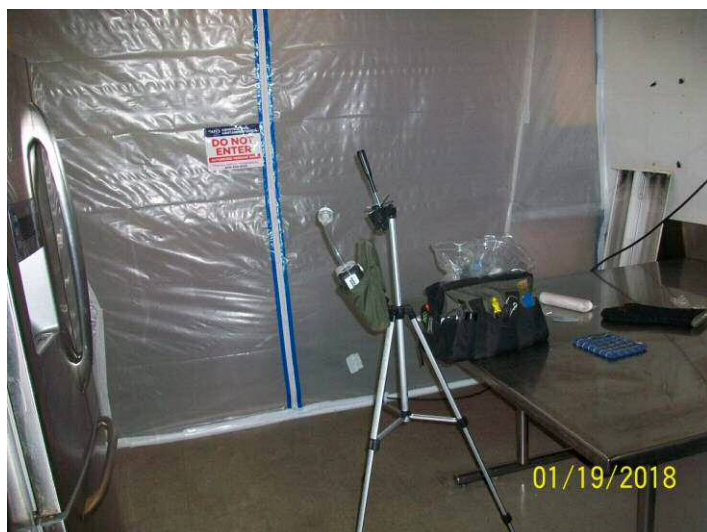




Pic 009\_r-Inside kitchen containment



Pic 010\_r



Pic 011\_r-Outside kitchen containment



Pic 012\_r





Pic 013\_r-Outdoor, back



Pic 014\_r



Pic 015\_r-Outside exercise containment



Pic 016\_r



Pic 017\_r-Inside exercise containment



Pic 018\_r

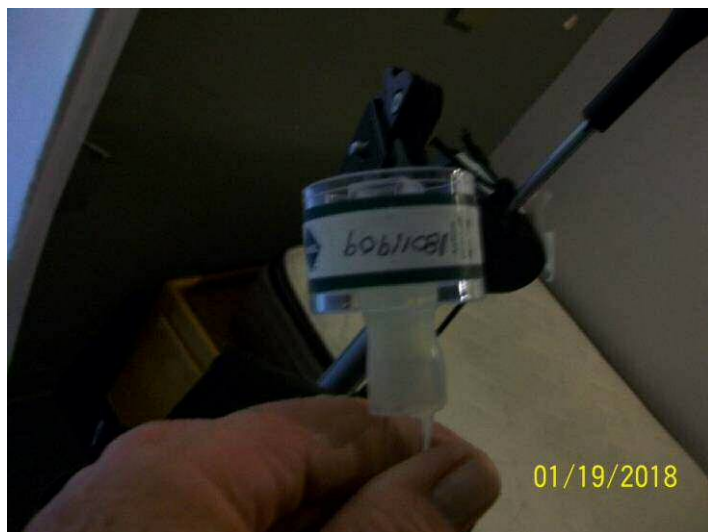


Pic 019\_r-Slate room 3 containment



Pic 020\_r-Air sample outside room 3 containment





Pic 021\_r



Pic 022\_r-Air sample inside room 3 containment



Pic 023\_r



Pic 024\_r-Outdoors front



Pic 025\_r



Pic 026\_r

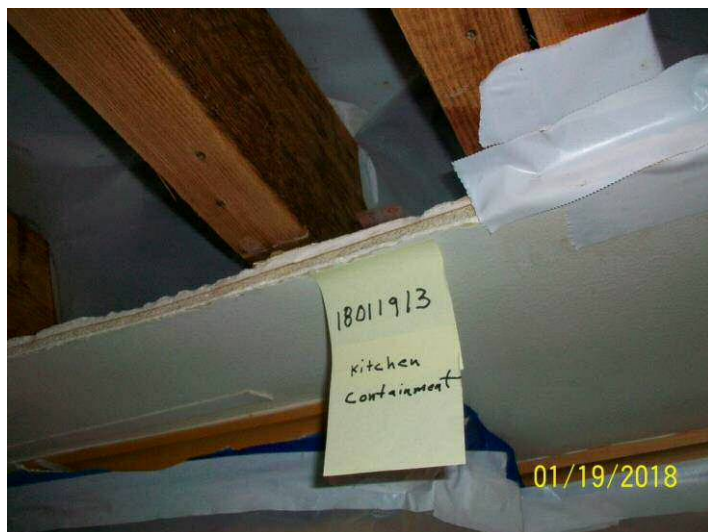


Pic 027\_r-Surface sample 1800913 in kitchen



Pic 028\_r

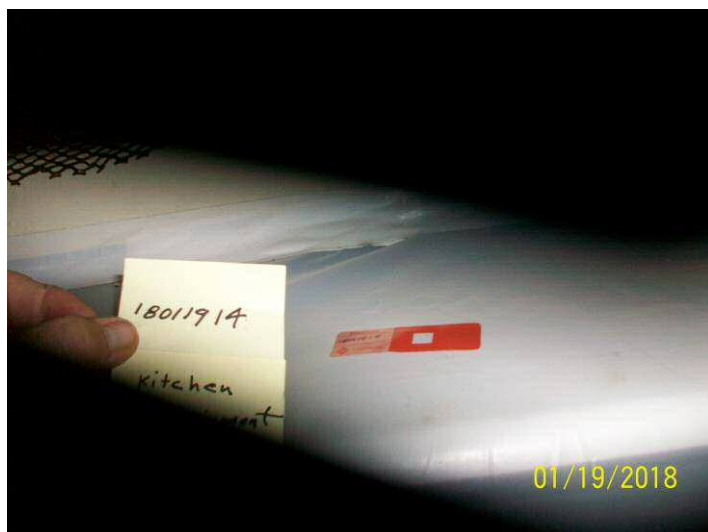




Pic 029\_r



Pic 030\_r



Pic 031\_r-Surface sample 18011914 kitchen



Pic 032\_r



Pic 033\_r-Surface sample 18011915 kitchen



Pic 034\_r



Pic 035\_r



Pic 036\_r-Surface sample 18011916-kitchen





Pic 037\_r



Pic 038\_r



Pic 039\_r



Pic 040\_r



Pic 041\_r



Pic 042\_r



Pic 043\_r



Pic 044\_r-end of kitchen containment photos





Pic 045\_r-Surface sample 18011917-exercise room



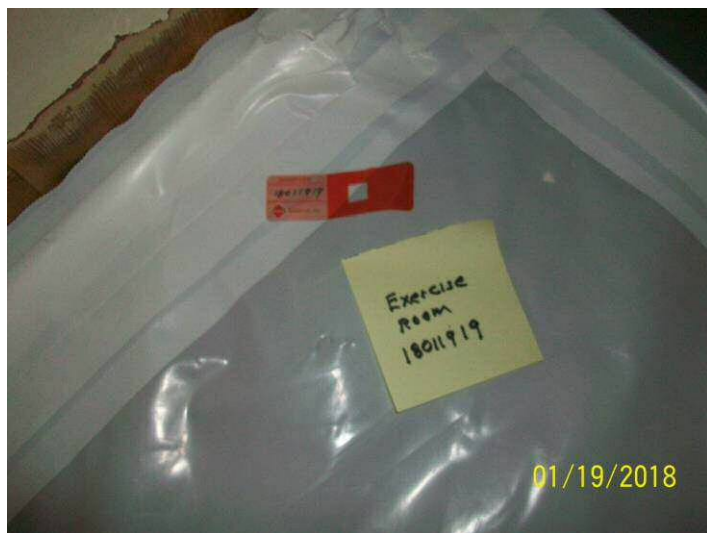
Pic 046\_r



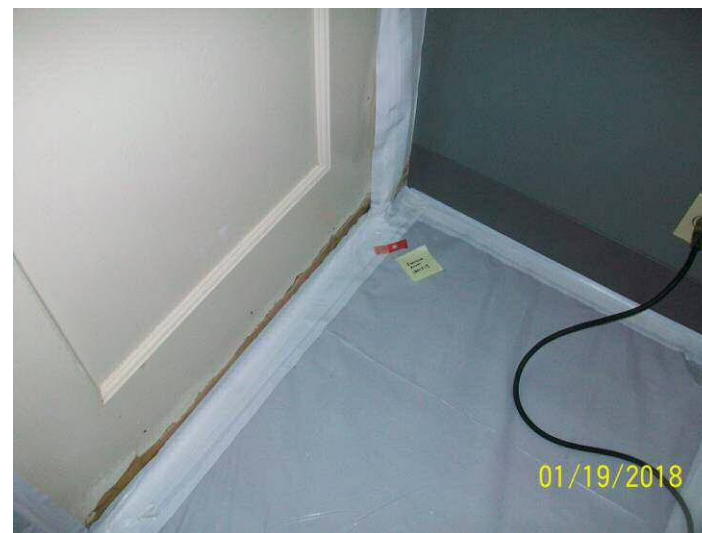
Pic 047\_r-Surface sample 18011918-exercise room



Pic 048\_r



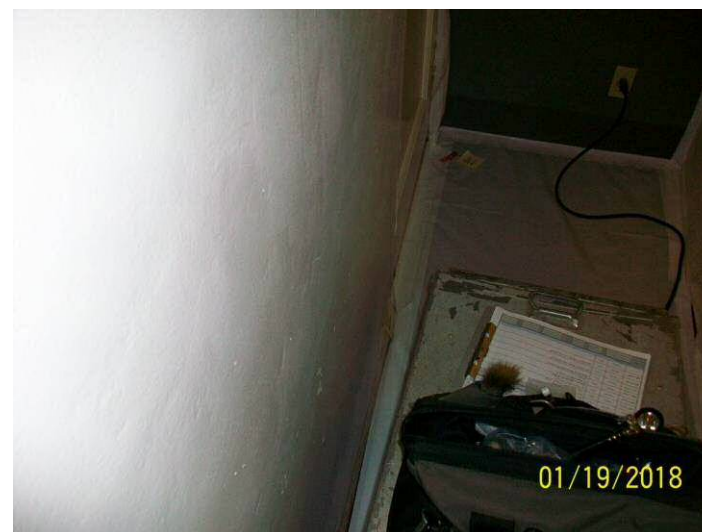
Pic 049\_r-Surface sample 18011919-exercise room



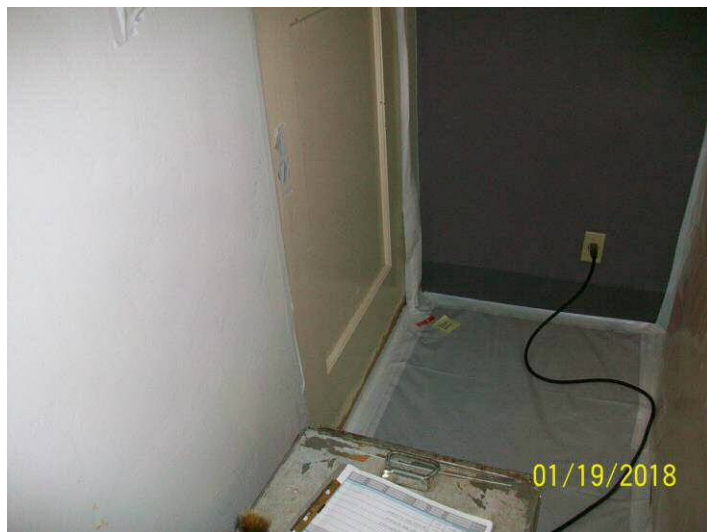
Pic 050\_r



Pic 051\_r



Pic 052\_r



Pic 053\_r



Pic 054\_r



Pic 055\_r



Pic 056\_r





Pic 057\_r



Pic 058\_r-End of exercise room photographs



Pic 059\_r-Surface sample 18011920-Room 3 containment

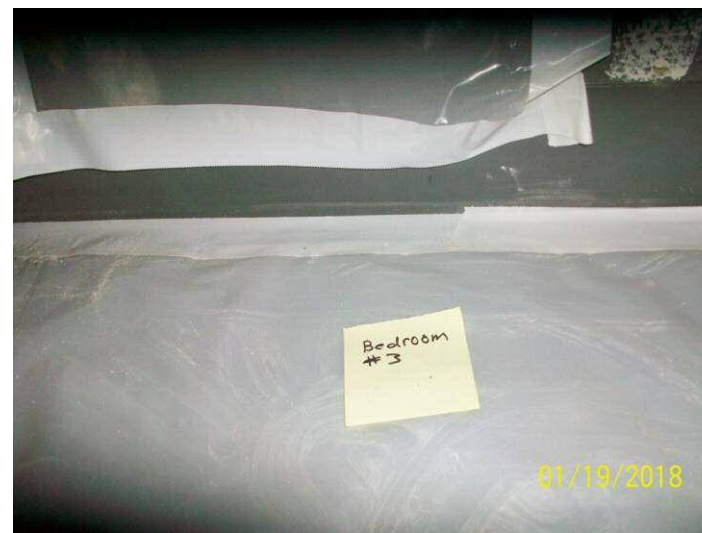


Pic 060\_r-Surface sample 18011921-Room 3 containment





Pic 061\_r-Surface sample 18011922-Room 3 containment



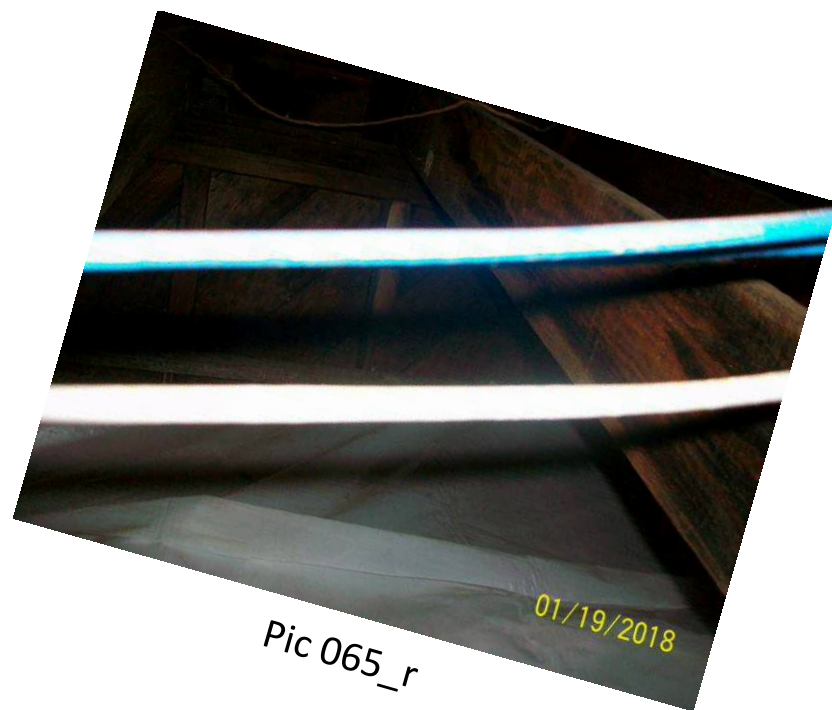
Pic 062\_r



Pic 063\_r



Pic 064\_r



Pic 065\_r



Pic 066\_r-End of room 3 containment photos

City of Long Beach-Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, CA

Post Remediation Survey – HSA Project Number  
180117LA

February 2, 2018





Pic 1 Front of Station



Pic 2 Front of Station



Pic 3 Room 3



Pic 4 Room 3 Outside Containment



Pic 5 Room 3 Outside Containment



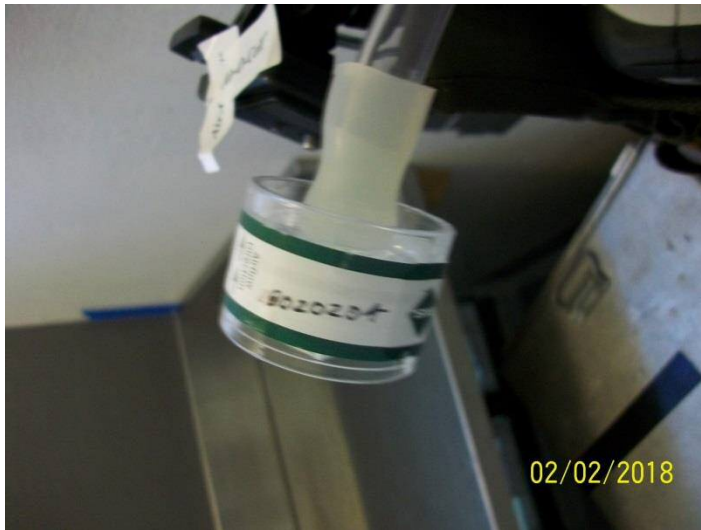
Pic 6 Room 3 Containment



Pic 7 Room 3 Containment



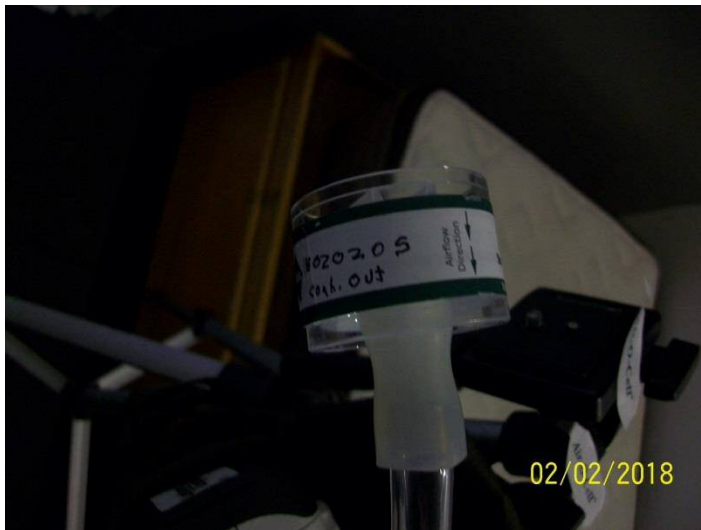
Pic 8 Room 3 Containment



Pic 9 Room 3 Containment



Pic 10 Room 3 Outside Containment



Pic 11 Room 3 Outside Containment



Pic 12 Back

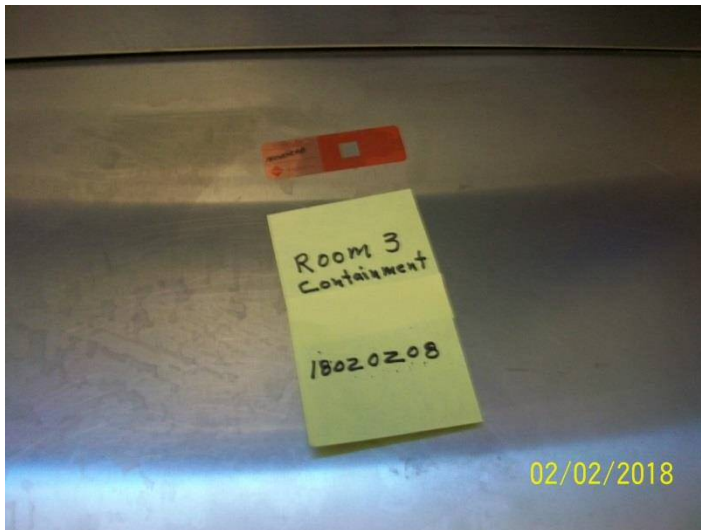




Pic 13 Back



Pic 14 Room 3 Containment Surface Sample



Pic 15Room 3 Containment Surface Sample



Pic 16 Room 3 Containment Surface Sample



Pic 17 Room 3 Containment Surface Sample



Pic 18 Room 3 Containment Surface Sample



Pic 19 Room 3 Containment Surface Sample



Pic 20 General





Pic 21 General



Pic 22 General



Pic 23 General



Pic 24 General



Pic 25 General



Pic 26 General



Pic 27 General



Pic 28 General





Pic 29 General



Pic 30 General



Pic 31 General



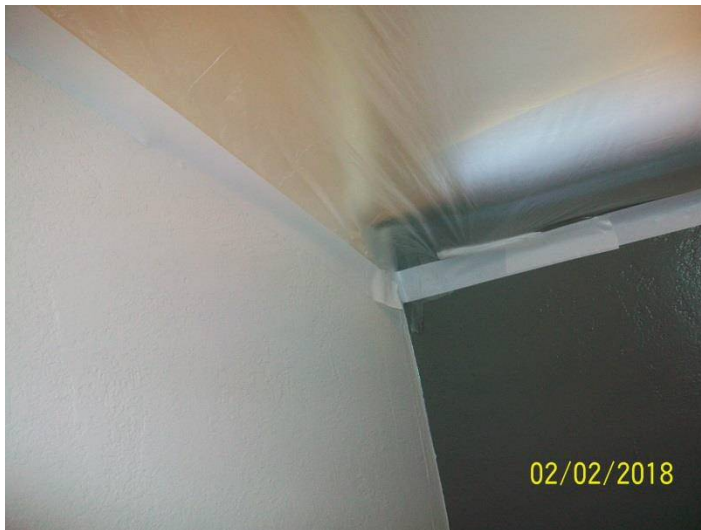
Pic 32 General



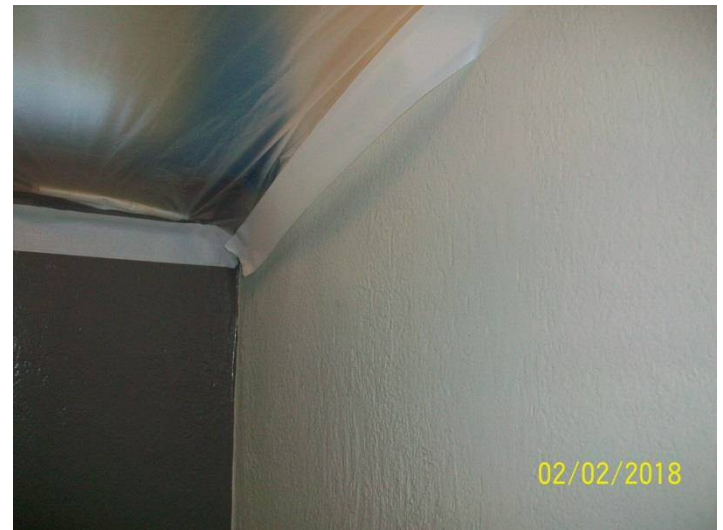
Pic 33 General



Pic 34 General



Pic 35 General



Pic 36 General



*Quarterly Industrial Hygiene Inspection (7/12/2018)*



TECHNICAL AND ADVISORY SERVICES • ENVIRONMENTAL HEALTH AND SAFETY

## Quarterly Industrial Hygiene Inspection

Performed at

City of Long Beach  
Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, California

Performed on June 4, 2018

Submitted To

Paul Alvarado  
Battalion Chief  
City of Long Beach  
Fire Department Headquarters  
3205 Lakewood Blvd  
Long Beach, CA 90808

HSA Project Number 180259LA

Report Date

July 12, 2018

Prepared By,

A handwritten signature in black ink, appearing to read 'Howard Ozar'.

Howard J. Ozar, CIH  
Industrial Hygienist

Reviewed By,

A handwritten signature in blue ink, appearing to read 'Joel I. Berman'.

Joel I. Berman, CIH, CSP, CAC, CIAQM  
Vice President



## EXECUTIVE SUMMARY

On June 4, 2018, Health Science Associates (HSA) performed a Quarterly Industrial Hygiene Inspection at the City of Long Beach Fire Station #9, located at 3917 Long Beach Blvd., Long Beach, California.

The purpose of this inspection was to perform the following: a visual inspection of the station to document general cleanliness of the surfaces in the building; an inspection of the attic space, the accessible roof areas, and the crawlspace under the first floor bathroom/shower area of the station; a moisture intrusion evaluation of the fire station using primarily a non-penetrating moisture meter and an inferred camera (the intention is to detect water leaks as early as possible); use a particle counter to determine the concentration of air borne dust in the station as compared to the outdoor environment; utilize a photo ionization detector (PID) with sensitivity to detect volatile organic compounds (VOCs) in parts per billion (ppb) range to determine whether there is any measurable levels above background/outside; and then the monitoring results were then evaluated and compared with background levels, Indoor Air Quality (IAQ) guidelines recommended by the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE), other guidelines and published references.

The background related to this fire station is that previously, there have been various IAQ and water intrusion issues in the fire station for an extended period of time. It was determined that there was fungal growth in the building and that the interior of the building had a heavy layer of built-up dust on various surfaces (see HSA project number reports 180034LA, 180081LA, and 180117LA). After the fungal remediation, HSA performed post fungal total spore air and surface remediation sampling to confirm that the remediation was successful and to document the cleanliness of the station (HSA Report 180117LA).

The results of this evaluation appears to document that there has been visible improvement in the general cleanliness of the fire station. However, when inspecting horizontal surfaces “white glove tests” three rooms stood out as having more dirt/grime than others. They were the exercise room on top of the vending machine, the kitchen, and the 2nd floor TV & Bedrooms. Additional surface cleaning is recommended in these rooms.

There were three areas that were measured which showed an elevated moisture level of moisture using the Tramex moisture meter. These areas were the 1st floor bathroom, captain’s office, and 2nd floor bedroom #3 and bathroom. HSA believes these were false positives due to the characteristic of the instrument based on our visual observations. It is recommended to follow-up with a Delmhorst BD-2100 meter which penetrates inside the wood or plaster for confirmation.

## EXECUTIVE SUMMARY (CONTINUED)

Particle count levels in the kitchen, captain's office, and 2nd Floor Bedroom #3 were elevated as compared to other areas sampled. The kitchen and captain's office had finer particulate from 0.3 micrometers ( $\mu\text{m}$ ) to 5  $\mu\text{m}$  in size. The 2nd Floor Bedroom #3 were larger, 10  $\mu\text{m}$  in size. It is recommended to re-clean these areas to see if the airborne levels are reduced during the next inspection.

VOCs levels were within normal range. The area of the kitchen had the greatest level of measurable VOCs of 385 ppb. Normal levels range between 1,000 - 2,000 ppb; greater levels, trigger requirements to identify the sources and eliminate or reduce their VOC emission. For example, carpet glues or garage chemicals.

It is recommended to clean the storage closet under the hall stairwell to gain access to crawlspace for future inspection (i.e., gain access).

The roof drains on the second floor balcony need to be cleaned of leaves and other trash. This could cause future water leaks indoors and lead to possible mold growth.

The hallway floor had some noticeable debris and should be vacuumed.

This report was prepared for use by City of Long Beach in evaluating the subject location. The information contained within this report is as factual as possible and the opinions related herein are based on HSA's experience in similar investigations. No warranty, therefore, is made to any persons other than City of Long Beach regarding the conclusions or recommendations included within this report. HSA will not release copies to a third party without prior written consent of City of Long Beach

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## 1.0 INTRODUCTION

- 1.1 On June 4, 2018, Health Science Associates (HSA) performed a Quarterly Industrial Hygiene Inspection at the City of Long Beach Fire Station #9, located at 3917 Long Beach Blvd., Long Beach, California.
- 1.2 Project inspection was performed by Howard J. Ozar, Certified Industrial Hygienist (CIH), assisted by Bryan Irvin, Industrial Hygiene Technician.
- 1.3 Task set-up, project management, and report review were performed by Joel I. Berman, CIH, CSP, Certified Asbestos Consultant (CAC), Certified Indoor Air Quality Manager (CIAQM), Vice President.
- 1.4 Purpose
  - 1.4.1 Perform a visual inspection of the station to document general cleanliness of the surfaces in the building.
  - 1.4.2 Perform an inspection of the attic space, the accessible roof areas, and the crawlspace under the first floor bathroom/shower area of the station.
  - 1.4.3 Perform a moisture intrusion evaluation of the fire station using primarily a non-penetrating moisture meter and an inferred camera. The intention is to detect water leaks as early as possible.
  - 1.4.4 Use a particle counter to determine the concentration of air borne dust in the station as compared to the outdoor environment.
  - 1.4.5 Utilize a photo ionization detector (PID) with sensitivity to detect volatile organic compounds (VOCs) in parts per billion (ppb) range to determine whether there are any measurable levels above background/outside.
- 1.5 The monitoring results were then evaluated and compared with background levels, Indoor Air Quality (IAQ) guidelines recommended by the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE), other guidelines and published references.

## 2.0 BACKGROUND

- 2.1 The background related to this fire station is that previously, there have been various IAQ and water intrusion issues in the fire station for an extended period of time. It was determined that there was fungal growth in the building and that the interior of the building had a heavy layer of built-up dust on various surfaces (see HSA project number reports 180034LA, 180081LA, and 180117LA).

- 2.2 After the fungal remediation, HSA performed post fungal total spore air and surface remediation sampling to confirm that the remediation was successful (HSA Report 180117LA).
- 2.3 After the post fungal remediation sampling determined that the containments could be removed, then a complete and thorough cleaning of the fire station was performed to clean the years of settled dust on various surfaces. HSA also recommended that thorough cleaning be instituted in the fire station to prevent significant dust build-up for recurring.
- 2.4 A visual inspection was performed in the fire station after the thorough cleaning was completed (HSA Report 180117LA).

### 3.0 ASSESSMENT

#### 3.1 Visual Inspection

- 3.1.1 A visual inspection of the station was conducted to document general cleanliness of surfaces. This was done by direct observation and by "white glove testing" to determine the extent of cleanliness.
- 3.1.2 The inspection also included the attic space, the accessible roof areas, and the crawlspace under the first floor bathroom/shower area of the station.

#### 3.2 Moisture Inspection

Moisture readings were taken from the drywall/plaster in various areas in the attic, under the stairwell in closet, exercise room, bathrooms, captain's office, garage, movie room, bedrooms, and kitchen. All measurements indicated that the walls were dry. Measurements were taken with a non-penetrating (non-destructive) meter.

#### 3.3 Particle Counter

- 3.3.1 Measurements of particle counts were collected from the exercise room, captain's office, kitchen, garage, outside front, locker area, shower/bathroom, movie room, rm. #3 bedroom, outside roof, and hallway 1st floor.
- 3.3.2 Measurements were analyzed by ranking particle counts from "1" greatest number of particles to "3" the third highest particle count. They were also compared to outdoors.

### 3.4 VOCs

3.4.1 Measurements of VOCs were collected from the exercise room, captain's office, kitchen, garage, outside front, locker area, shower/bathroom, movie room, rm. #3 bedroom, outside roof, and hallway 1st floor.

3.4.2 Measurements were analyzed by ranking VOC concentrations from "1" greatest concentration in parts per million (ppm) to "3" the third highest concentration in ppm. They were also compared to outdoors levels.

### 3.5 Roof Inspection

Debris build-up was observed inside the drainage scuppers, particularly on the south side of the building.

## 4.0 METHODS

4.1 A RAE ppbRAE 3000 Photo Ionization Detector (PID) which can measure VOC levels in parts per billion (ppb) was used to measure indoor and outdoor VOC levels.

4.2 A TSI 9306V Aerotrak handheld particle counter was used to measure indoor and outdoor particle levels.

4.3 A Tramex handheld moisture meter that was used to measure levels of moisture in building materials. This is a non-destructive type instrument that is based on surface resistance.

4.4 A FLIR inferred camera was used to measure surface temperature of various surfaces in the building. Cold surface areas in are represented by "blue", which usually indicate wet areas due to the cooling effect of evaporating moisture on surfaces.

## 5.0 STANDARDS AND GUIDELINES

### 5.1 Occupational Exposures

To assess the extent of exposure, survey results are compared with regulatory standards and/or professionally recommended guidelines. For occupational exposures, reference values are published by the American Conference of Governmental Industrial Hygienists (ACGIH) and regulatory standards are set by both federal and state Occupational Safety and Health Administrations, OSHA and Cal/OSHA.

5.1.1 Both the regulatory standards and ACGIH guidelines are designed to protect workers from exposures to unhealthful concentrations of substances. However, the levels established by these bodies may not necessarily eliminate all effects for all people, e.g., mild irritations, response to odors, unique sensitivities, etc.

5.1.2 California OSHA

Regulatory limits are described as permissible exposure limits (PELs), action levels (ALs), ceiling (C) limits, and/or short-term exposure limits (STELs).

5.1.3 ACGIH

The ACGIH identifies its recommendations as threshold limit values (TLVs), ceiling (C) limits, and short-term exposure limits (STELs).

5.1.4 PELs, ALs, and TLVs are expressed as 8-hour TWAs for a normal eight-hour workday and a forty-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.<sup>1</sup> Ceiling limits should never be exceeded, even for brief periods. STELs generally refer to concentrations to which workers can be exposed for a short period of time without suffering from irritation, chronic, or irreversible tissue damage or narcosis of sufficient degree to increase the likelihood of accidental injury, impair self-rescue, or materially reduce work efficiency, and provided that the daily TLV-TWA is not exceeded. The STEL is not a separate, independent exposure limit; rather, it supplements the TWA where there are recognized acute effects from a substance whose toxic effects are primarily of a chronic nature.

5.2 IAQ

5.2.1 Sick building syndrome (SBS) and IAQ concerns rarely, if ever, involve exposures to substances at PEL or TLV levels. The control of SBS and IAQ concerns in non-industrial environments are generally based on perceived air quality, ventilation systems' characteristics, operational performance, and quality of system maintenance (PM).

5.2.1.1 ASHRAE Standard 62.1 - 2010, "Ventilation for Acceptable Indoor Air Quality".<sup>2</sup>

---

<sup>1</sup>2018 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, *American Conference of Governmental Industrial Hygienists*, p. 4.

<sup>2</sup>American Society of Heating, Refrigerating, and Air-Conditioning Engineers, "Ventilation for Acceptable Indoor Air Quality", ASHRAE 62.1-2010, Atlanta, GA, *American Society of Heating, Refrigerating, and Air-Conditioning Engineers*, 2010.

2.1.1.1 The purpose of this standard is to specify minimum ventilation rates and other measures intended to provide indoor air quality that is acceptable to human occupants and that minimize adverse health effects. The standard is intended to be used as a guide to help improve IAQ in existing buildings or a design standard in construction specifications.

2.1.1.2 On method to determine acceptable air quality is achieved within the space by controlling identified contaminants of concern (COC) and comparison of their concentration with IAQ references (normal or trigger/action responses); the generally perceived air quality by occupant percentage (if poor then increase fresh air flow); mass balance analysis (air dilution) to determine proper fresh minimum requirements; and/or a variation of Ventilation Rate Procedures and IAQ Procedures.

5.2.2 The following table represents many of the IAQ reference levels that are typically compared with measured contaminate levels in IAQ surveys. Typical indoor concentrations are provided along with levels above identified trigger concentrations indicating the need for further investigations.

Test	Typical Indoor Concentration	Trigger Concentration
Asbestos	<0.01 f/cc	>0.01 f/cc
Bioaerosols	Varies	2-3 Times Greater than Other Spaces or Outdoors
Carbon Dioxide	400-1000 ppm	800 ppm 700 ppm +Background
Carbon Monoxide	1-3 ppm	>5 ppm
Formaldehyde	0.01-0.05 ppm	>0.05 ppm
Moisture	Varies	40- 60 %
Nitrogen Dioxide	0.01-0.05 ppm	>0.05 ppm
Odors	None	Detectable for Extended Time
Ozone	0.01-0.02 ppm	>0.05 ppm
Particles (Dust)	<50 µg/m <sup>3</sup> (total)	>50 µg/m <sup>3</sup>
Radon	<0.5 pCi/L	>4 pCi/L
VOCs	<300 µg/m <sup>3</sup> 1-2 ppm	300 µg/m <sup>3</sup> to 3000 µg/m <sup>3</sup> Depending on Chemicals
Ref. - IAQ and HVAC Workbook, 4th Edition, Revised and Updated 2001, D.Jeff Burton, CIH,PE, CSP, ISBN 1-883992-16-8, Contaminant Concentration Checklist, p. A-27		

*Table: Indoor Air Quality Typical and Trigger Levels*

## 6.0 SURVEY RESULTS, DISCUSSION, AND RECOMMENDATIONS

6.1 The results tables relating to this survey are listed below.



- 6.1.1 Table I - Visual Inspection.
- 6.1.2 Table II - Moisture Meter.
- 6.1.3 Table III - Particle Counter.
- 6.1.4 Table IV - Volatile Organic Compounds.
- 6.2 Appendices
  - 6.2.1 Calibration Documentation are provided in APPENDIX I - Calibration Certificates.
  - 6.2.2 Project photographs are provided in APPENDIX II - Photographs.
- 6.3 Findings
  - 6.3.1 There appears to be a visible improvement in the general cleanliness of the fire station. However, when inspecting horizontal surfaces “white glove tests” three rooms stood out as having more dirt/grime than others. They were the exercise room on top of the vending machine, the kitchen, and the 2<sup>nd</sup> floor TV & Bedrooms. Additional surface cleaning is recommended in these rooms.
  - 6.3.2 There were three areas that were measured which showed an elevated moisture level of moisture using the Tramex moisture meter. These areas were the 1<sup>st</sup> floor bathroom, captain’s office, and 2<sup>nd</sup> floor bedroom #3 and bathroom. HSA believes these were false positives due to the characteristic of the instrument based on our visual observations. It is recommended to follow-up with a Delmhorst BD-2100 meter which penetrates inside the wood or plaster for conformation.
  - 6.3.3 Particle count levels in the kitchen, captain's office, and 2nd Floor Bedroom #3 were elevated as compared to other areas sampled. The kitchen and captain's office had finer particulate from 0.3 micrometers ( $\mu\text{m}$ ) to 5  $\mu\text{m}$  in size. The 2nd Floor Bedroom #3 were larger, 10  $\mu\text{m}$  in size. It is recommended to re-clean these areas to see if the airborne levels are reduced during the next inspection.
  - 6.3.4 VOCs levels were within normal range. The area of the kitchen had the greatest level of measurable VOCs of 385 ppb. Normal levels range between 1,000 - 2,000 ppb; greater levels, trigger requirements to identify the sources and eliminate or reduce their VOC emission. For example, carpet glues or garage chemicals.
  - 6.3.5 It is recommended to clean the storage closet under the hall stairwell to gain access to crawlspace for future inspection (i.e., gain access).

- 6.3.6 The roof drains on the second floor balcony need to be cleaned of leaves and other trash. This could cause future water leaks indoors and lead to possible mold growth.
  - 6.3.7 The hallway floor had some noticeable debris and should be vacuumed.
- 6.4 This report was prepared for use by City of Long Beach in evaluating the subject location. The information contained within this report is as factual as possible and the opinions related herein are based on HSA's experience in similar investigations. No warranty, therefore, is made to any persons other than City of Long Beach regarding the conclusions or recommendations included within this report. HSA will not release copies to a third party without prior written consent of City of Long Beach.

Table I - Visual Inspection

City of Long Beach Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, California  
June 4, 2018

Description	Evaluation	Comment
General Areas	Satisfactory	
Crawlspace	No Access	Recommend clearing closet/access under stairwell of all boxes and stored material for next inspection.
Attic Space	Satisfactory	Noticeable difference. Much cleaner/less dust.
Under Stairwell Closet	No Access	Recommend clearing closet/access under stairwell of all boxes and stored material.
Exercise Room	Improvement	Horizontal Surfaces Dusty/Grimy (white glove tests)
1st Floor Bathroom Shower Room	Satisfactory	
Captain's Office	Satisfactory	
Garage	Satisfactory	
1st Floor Hallway	Satisfactory	
2nd Floor TV & Bedrooms	Improvement	Horizontal Surfaces Dusty/Grimy (white glove tests)
Kitchen	Improvement	Horizontal Surfaces Dusty/Grimy (white glove tests)
Roof Drain	Improvement	Plugged with Debris

Table II - Moisture Meter

City of Long Beach Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, California  
June 4, 2018

Description	Evaluation	Comment
General Areas	Satisfactory	
Crawlspace	No Access	Recommend clearing closet/access under stairwell of all boxes and stored material.
Attic Space	Satisfactory	
Under Stairwell Closet	Satisfactory	
Exercise Room	Satisfactory	
1st Floor Bathroom Shower Room	Satisfactory	There maybe false positives. Follow-up with HSA PM for next quarter inspection. Use a Delmhorst BD-2100 meter for conformation.
Captain's Office	Satisfactory	There maybe false positives. Follow-up with HSA PM for next quarter inspection.. Use a Delmhorst BD-2100 meter for conformation.
Garage	Satisfactory	
1st Floor Hallway	Satisfactory	
2nd Floor TV & Bedrooms	Satisfactory	There maybe false positives. Follow-up with HSA PM for next quarter inspection.. Use a Delmhorst BD-2100 meter for conformation.
Kitchen	Satisfactory	
<b>Instrumentation:</b> Tramex Moisture Encounter Plus		



Table III - Air Sampling Results for Particle Counter

City of Long Beach Fire Station #9  
 3917 Long Beach Blvd.  
 Long Beach, California  
 June 4, 2018

Particle Size Distribution	Exercise Room	Captains Office	Kitchen	Garage	Outside Front	Locker Area	Shower/Bathroom	TV Room	Rm. #3 Bedroom	Outside Roof	Hallway 1st Floor	Rank Order (1, 2, and 3)
0.3 µm	126382	118642	1404419 Rec. Cleaning	167657	176953	129801	131431	120046	118306	184562	112927	1 Kitchen 2 Outside Fr 3 Outside Fr
0.5 µm	21779	322433 Rec. Cleaning	29008	37989	38833	22255	22593	24921	23002	39138	11706	1 Captains 2 Outside 3 Outside
1.0 µm	5521	6598	8761	13665	14618	5936	5832	7157	5889	13743	5546	1 Outside 2 Outside 3 Garage
3.0 µm	451	843	935	1658	1614	696	518	736	803	1440	487	1 Garage 2 Outside 3 Outside
5.0 µm	145	347	335	549	492	291	154	255	350	447	166	1 Garage 2 Outside 3 Outside
10 µm	18	56	43	63	46	51	23	41	61 Rec. Cleaning	33	25	1 Garage 2 Rm. #3 Bedroom 3 Captain
Abbreviation: µm=micro meters												





Table IV - Air Sampling Results for Volatile Organic Compounds

City of Long Beach Fire Station #9  
 3917 Long Beach Blvd.  
 Long Beach, California  
 June 4, 2018

Description	Exercise Room	Captains Office	Kitchen	Garage	Outside Front	Locker Area	Shower/Bathroom	TV Room	Rm. #3 Bedroom	Outside Roof	Hallway 1st Floor	Rank Order (1, 2, and 3)
VOCs (ppb)	182	171	385 Expected - Kitchen Grease/Food etc	111	88	216	307	206	242	105	182	1 Kitchen 2 Shower/Bth 3 Rm. #3 Bd
<b>Abbreviation:</b> ppb=parts per billion; Normal Levels = 1-2 ppm (1000-2000 ppb)												

## **APPENDIX I - Calibration Certificates**



# CERTIFICATE OF CALIBRATION

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

ENVIRONMENT CONDITION		
TEMPERATURE	75.4 (24.1)	°F (°C)
RELATIVE HUMIDITY	25	%RH
BAROMETRIC PRESSURE	29.09 (985.1)	inHg (hPa)

MODEL	9306-V2
SERIAL NUMBER	93061645003
CUSTOMER INST ID	

<input checked="" type="checkbox"/> AS LEFT	<input checked="" type="checkbox"/> IN TOLERANCE
<input type="checkbox"/> AS FOUND	<input type="checkbox"/> OUT OF TOLERANCE

AEROTrak CALIBRATION KIT			
MEASUREMENT VARIABLE	SYSTEM ID	DATE LAST CALIBRATED	CALIBRATION DUE DATE
FLOW METER	E003739	6/30/2017	12/31/2017
7201-02F	E005520	9/18/2017	3/31/2018
FLOW METER	E005633	7/12/2017	1/31/2018

PARTICLE STANDARDS				
PARTICLE SIZE	STANDARD UNCERTAINTY	STANDARD DEVIATION	LOT NO.	EXPIRATION DATE
0.303 µm	0.003 µm	0.0047 µm	174664	10/31/2019
0.508 µm	0.004 µm	0.0085 µm	168223	4/30/2019
0.994 µm	0.0075 µm	0.010 µm	171667	7/31/2019
3.000 µm	0.01 µm	0.03 µm	167683	3/31/2019
5.020 µm	0.015 µm	0.06 µm	179268	1/31/2020
9.850 µm	0.04 µm	0.13 µm	172685	8/31/2019

TSI does hereby certify that the calibration performed on the above described instrument meets the requirements of ISO 21501-4. TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to the United States National Institute of Standards and Technology (NIST) or has been verified with respect to instrumentation whose accuracy is traceable to NIST, or is derived from accepted values of physical constants. TSI is registered to ISO-9001:2015.

Charles Traone  
CALIBRATED

November 22, 2017

DATE





# CERTIFICATE OF CALIBRATION

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

## SIZE CALIBRATION AND VERIFICATION OF SIZE SETTING

NOMINAL PARTICLE SIZE	GAIN STAGE	DIGITAL CUTPOINT	EXPANDED UNCERTAINTY
0.3 $\mu\text{m}$	A	36	4.1%
0.5 $\mu\text{m}$	A	340	3.9%
1 $\mu\text{m}$	B	7	3.9%
3 $\mu\text{m}$	B	55	3.6%
5 $\mu\text{m}$	B	133	3.6%
10 $\mu\text{m}$	B	500	3.7%

## COUNTING EFFICIENCY

PARTICLE SIZE	ACTUAL	ALLOWABLE RANGE	PASS/FAIL
0.3 $\mu\text{m}$	47%	50% $\pm$ 20%	Pass
0.5 $\mu\text{m}$	93%	100% $\pm$ 10%	Pass

## SIZE RESOLUTION

PARTICLE SIZE	MEASURED	ALLOWABLE RANGE	PASS/FAIL
0.5 $\mu\text{m}$	7.4%	$\leq$ 15%	Pass

## FALSE COUNT RATE

SAMPLE TIME (MIN)	SAMPLED (L)	MEASURED COUNTS (#)	CONCENTRATION ( $\#/\text{M}^3$ )	95% UCL ( $\#/\text{M}^3$ )	ALLOWABLE RANGE ( $\#/\text{M}^3$ )	PASS/FAIL
30	85	0	0.00	35.3	$\leq$ 70.7	Pass

## SAMPLING FLOW RATE (L/MIN)

NOMINAL	ACTUAL	ERROR	ALLOWABLE RANGE	PASS/FAIL
2.83	2.83	0.0 %	$\pm$ 5%	Pass

## SAMPLING TIME †

MEASURED	ALLOWABLE RANGE	PASS/FAIL
$< \pm 0.1\%$	$\pm 1\%$	Pass

## RESPONSE RATE †

MEASURED	ALLOWABLE RANGE	PASS/FAIL
0.08%	$\leq 0.5\%$	Pass

## MAXIMUM PARTICLE CONCENTRATION †

210000000  $\#/\text{m}^3$  @10% Coincidence Loss

† Tested and verified during product development

## CALIBRATION INTERVAL

CALIBRATION DATE	EXPIRATION DATE
November 22, 2017	November 22, 2018

Work Order No.: SE-057015

Date of Service: 6/1/2018

Unit Under Test: RAE ppbRAE 3000 PID

Asset No.: FA02334

Technician: Christine Tong

Initials: CXT

Serial No: 594-906722

TEST	Specification	Result
Standard Calibration	Pass/Fail	PASS

## TEST STANDARDS USED:

DESCRIPTION	LOT NO./EXPIRATION DATE	QUANTITY
10ppm Isobutylene in Air	Lot No. IAO-248-10-6 Exp.08/20/18	1

## TEST EQUIPMENT USED:

DESCRIPTION	ASSET NO.	SERIAL NO.	DATE OF LAST CAL	DATE CAL DUE

Test Equipment and standards are traceable to National standards.

**Installed 10.6 eV lamp**



## **APPENDIX II - Photographs**



Pic 001  
Exc. Rm. S. Wall



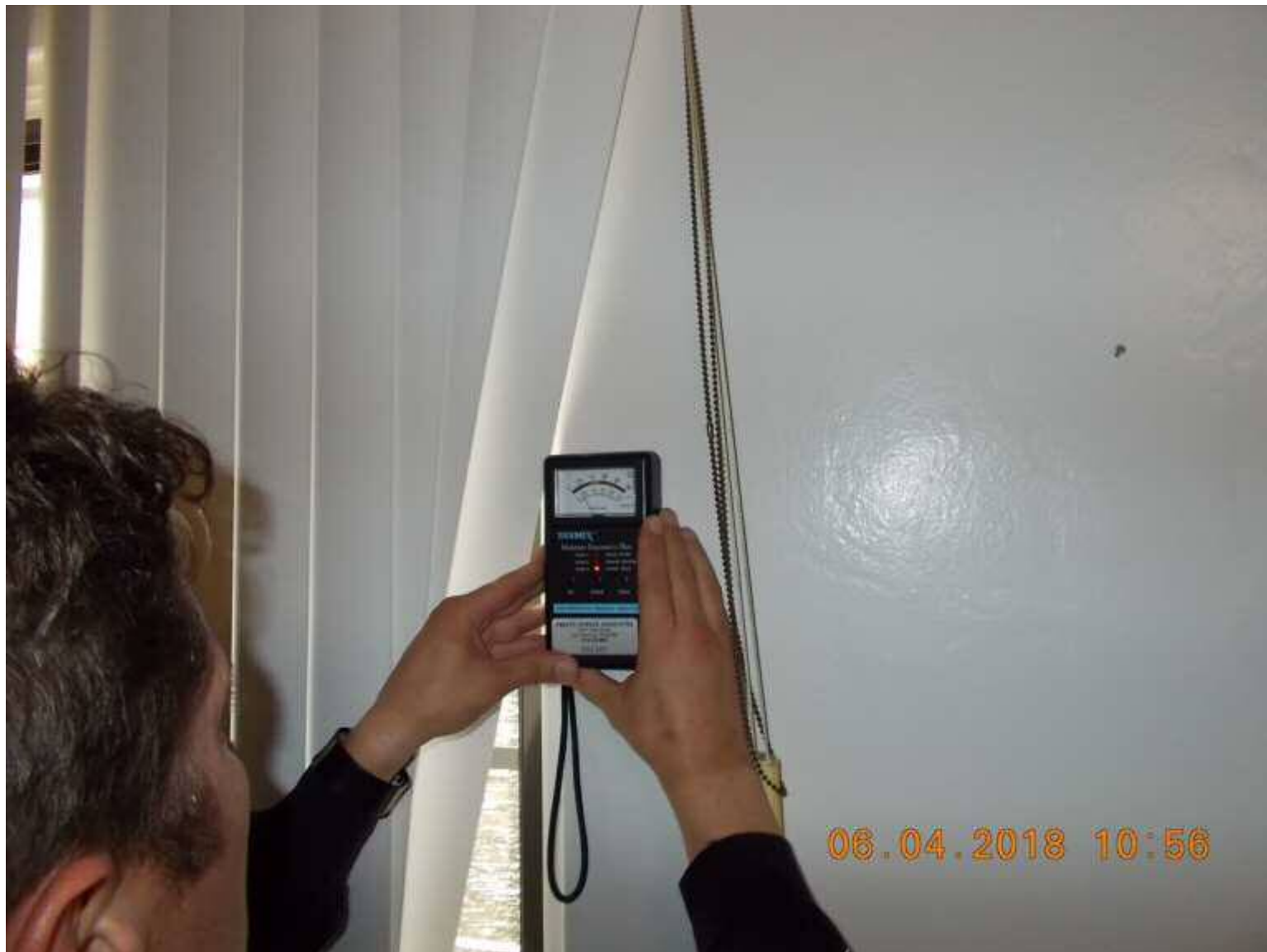
Pic 002  
Exc. Rm. S. Wall



Pic 003  
Exc. Rm. S. Wall



Pic 004  
Exc. Rm. S. Wall

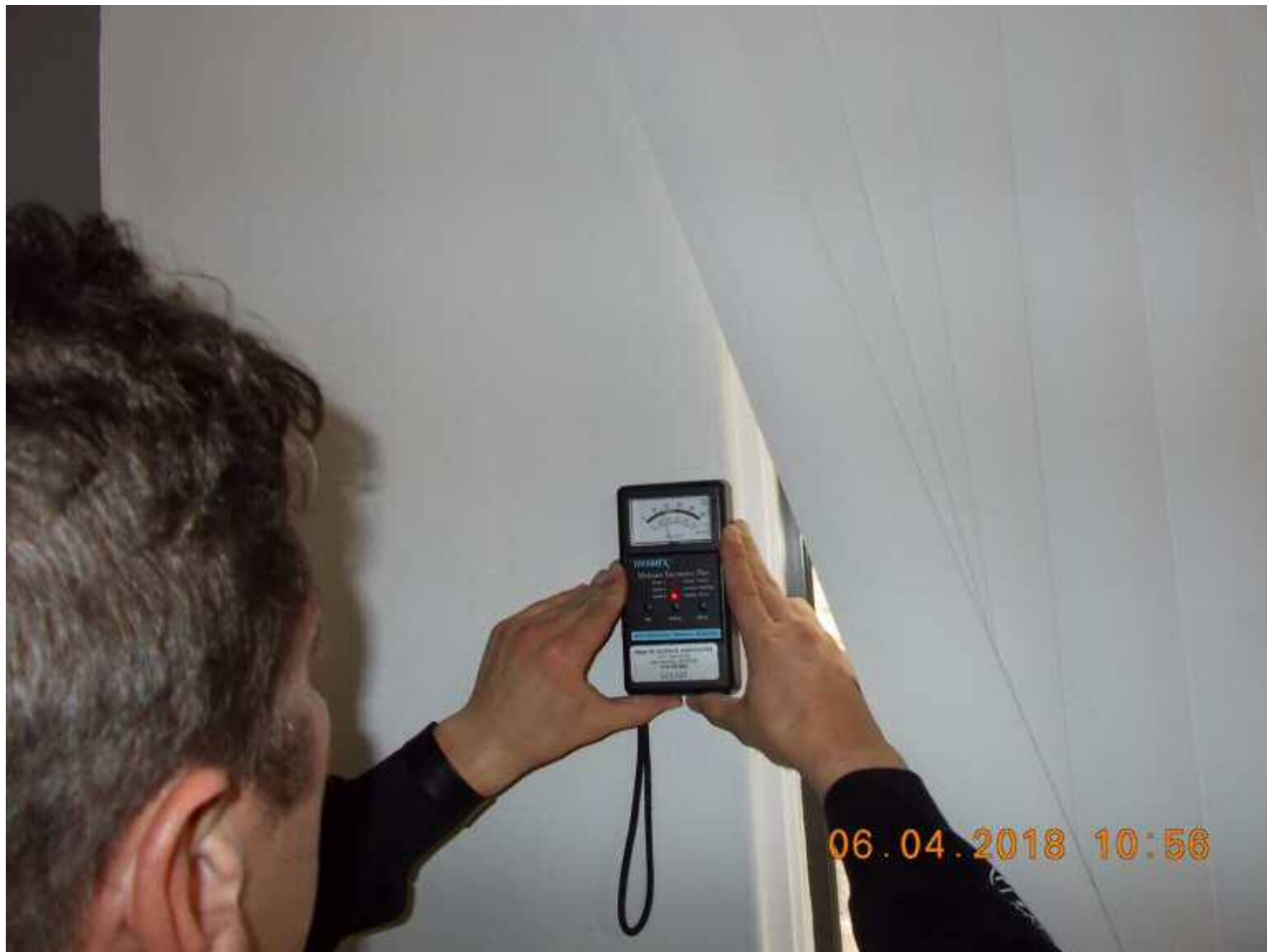


Pic 005  
Exc. Rm. S. Wall





Pic 006  
Exc. Rm. S. Wall



Pic 007  
Exc. Rm. S. Wall



Pic 008  
Exc. Rm. S. Wall



Pic 009  
Exc. Rm. S. Wall



Pic 010  
Exc. Rm. E. Wall



Pic 011  
Captain's Office





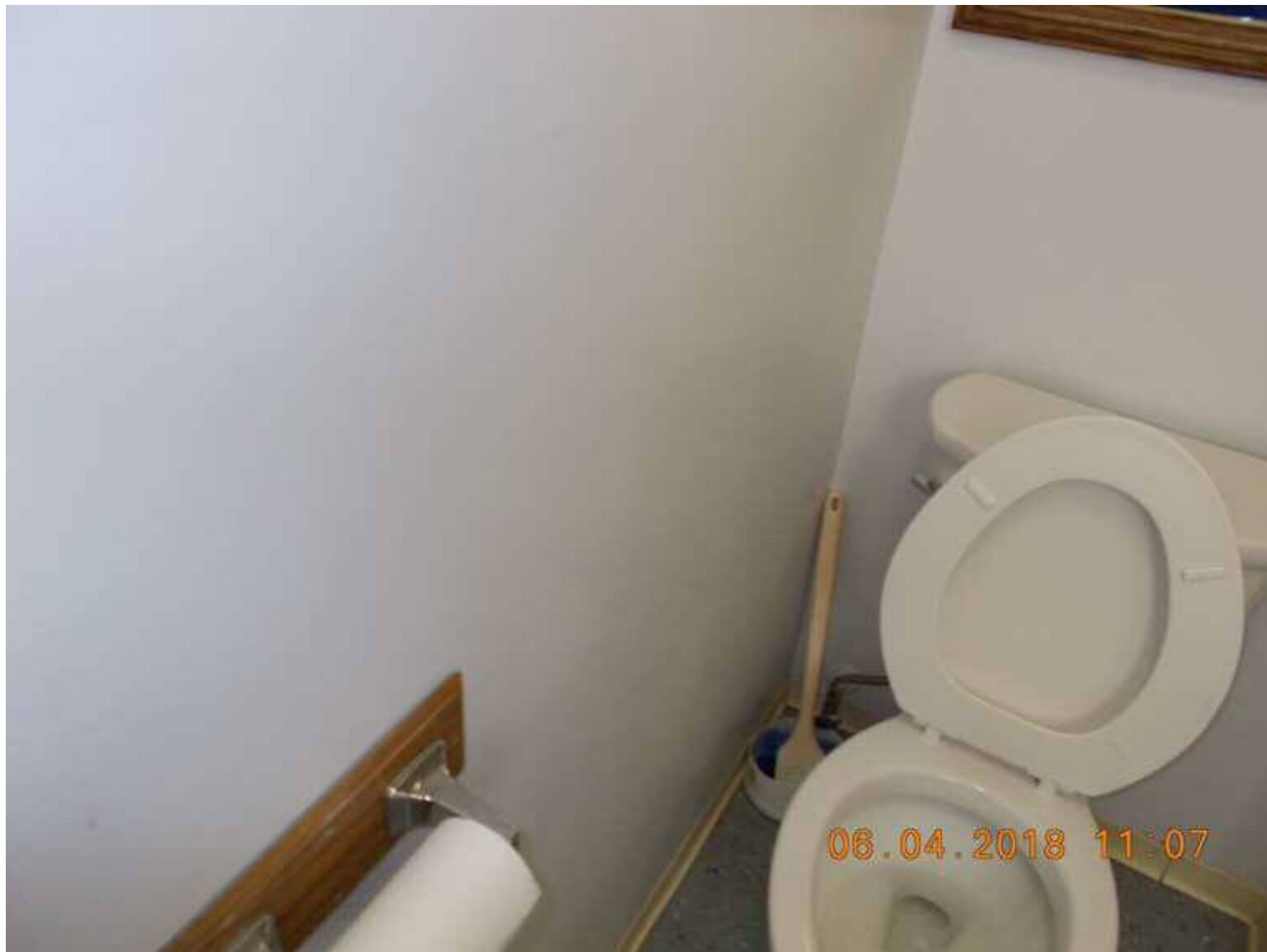
Pic 012  
Captain's Office



Pic 013  
Captain's Office



Pic 014  
Captain's Office



Pic 015  
Captain's Office (Restroom)



Pic 016  
Captain's Office (Restroom)



Pic 017  
Captain's Office (Restroom)





Pic 018  
Captain's Office (Restroom)



Pic 019  
Under Stairwell Storage Closet



06.04.2018 11:16

Pic 020  
Under Stairwell Storage Closet



Pic 021  
Under Stairwell Storage Closet





Pic 022  
Under Stairwell Storage Closet

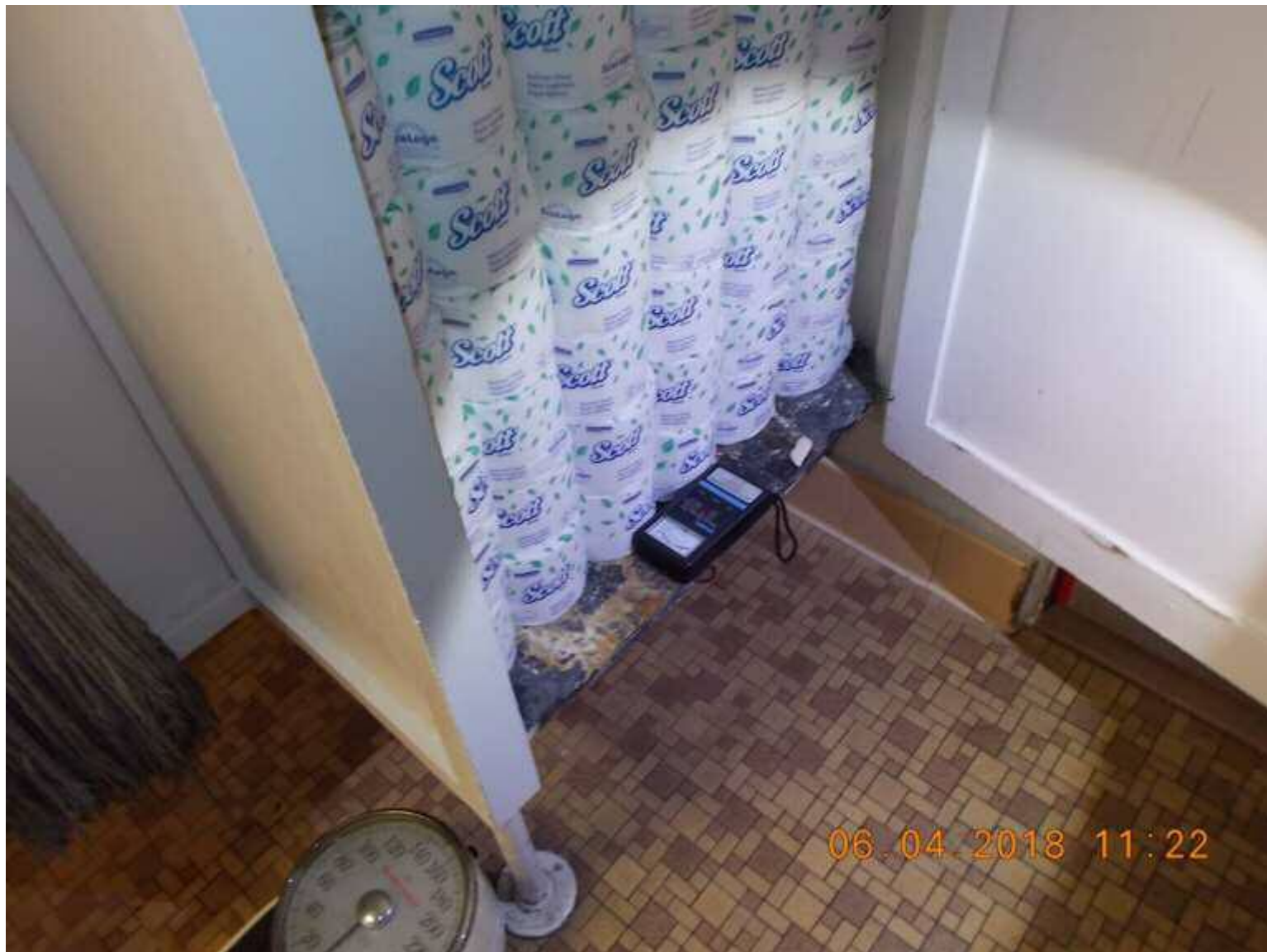


Pic 023  
Under Stairwell Storage Closet





Pic 024  
1<sup>st</sup> Floor Bathroom and Shower



Pic 025  
1<sup>st</sup> Floor Bathroom and Shower





Pic 026  
1<sup>st</sup> Floor Bathroom and Shower



Pic 027  
1<sup>st</sup> Floor Bathroom and Shower



Pic 028  
1<sup>st</sup> Floor Bathroom and Shower





Pic 029  
1<sup>st</sup> Floor Bathroom and Shower



Pic 030  
1<sup>st</sup> Floor Bathroom and Shower



Pic 031  
1<sup>st</sup> Floor Bathroom and Shower



Pic 032  
1<sup>st</sup> Floor Bathroom and Shower



Pic 033  
1<sup>st</sup> Floor Bathroom and Shower





Pic 034  
1<sup>st</sup> Floor Bathroom and Shower



Pic 035  
1<sup>st</sup> Floor Bathroom and Shower



Pic 036  
1<sup>st</sup> Floor Bathroom and Shower



Pic 037  
1<sup>st</sup> Floor Bathroom and Shower



Pic 038  
1<sup>st</sup> Floor Bathroom and Shower

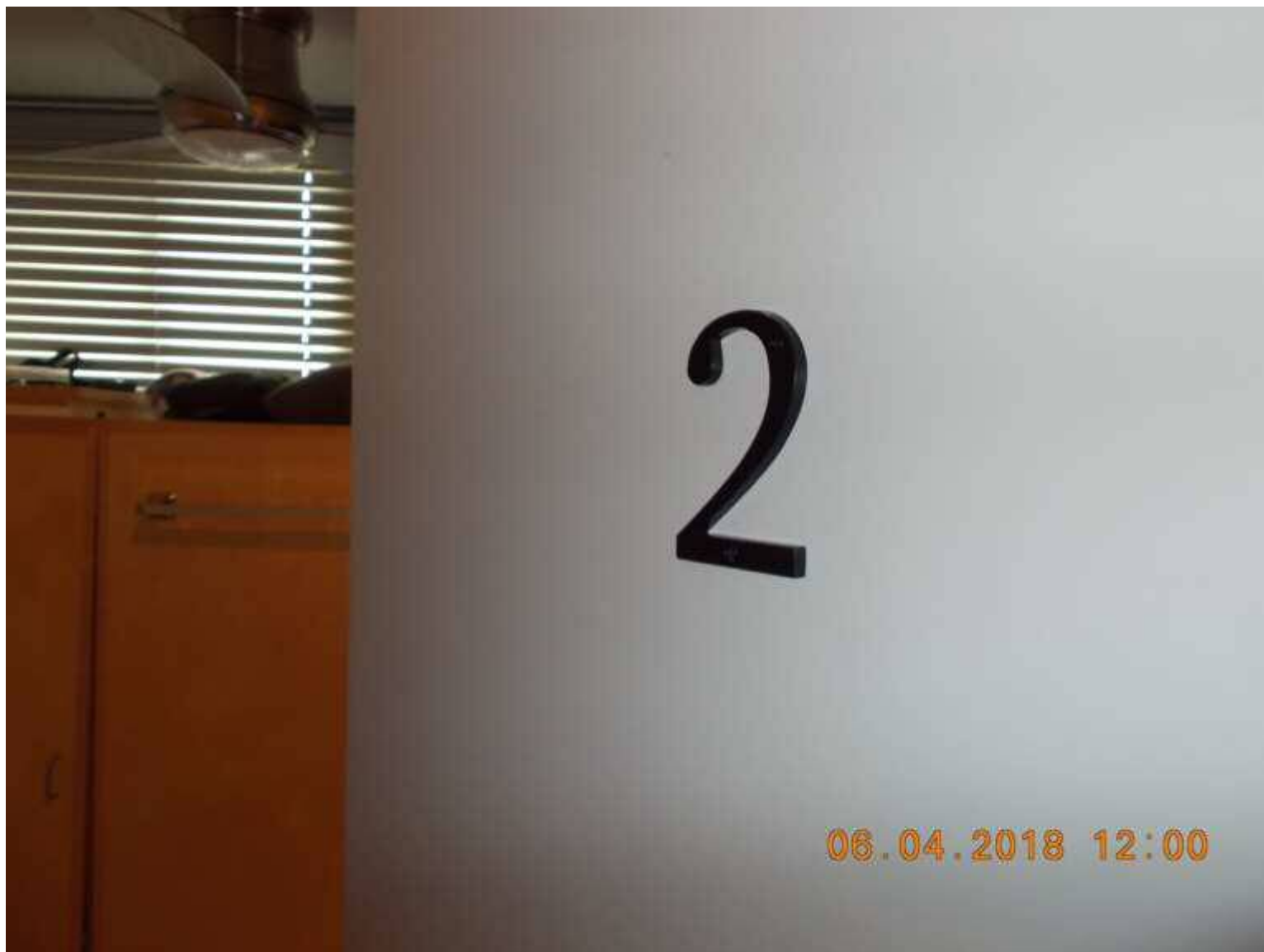




Pic 039  
Garage



Pic 040  
Garage



Pic 041  
2<sup>nd</sup> Floor Bedroom #2



Pic 043  
2<sup>nd</sup> Floor Bedroom #2



Pic 044  
2<sup>nd</sup> Floor Bedroom #2





Pic 045  
2<sup>nd</sup> Floor Bathroom



Pic 046  
2<sup>nd</sup> Floor Bathroom



Pic 047  
2<sup>nd</sup> Floor Bathroom



Pic 048  
2<sup>nd</sup> Floor Bathroom



Pic 049  
2<sup>nd</sup> Floor Bathroom





Pic 050  
2<sup>nd</sup> Floor Bathroom



Pic 051  
2<sup>nd</sup> Floor Outside Balcony Drain





Pic 052  
2<sup>nd</sup> Floor Outside Balcony Drain



Pic 053  
Attic AC Unit





Pic 054  
Attic Ductwork





Pic 055  
Attic Ductwork



Pic 056  
Attic Ductwork





Pic 057  
Attic (behind Bathroom)



Pic 058  
Attic (above Kitchen)





Pic 059  
Attic (above Kitchen)





Pic 060  
Attic (above Kitchen)



Pic 061  
Attic (above Kitchen)



Pic 062  
Attic (above Kitchen)





Pic 063  
Attic (above Kitchen)



Pic 068  
Attic (above Kitchen)





Pic 070  
Attic (above Kitchen)



Pic 072  
Attic (above Kitchen)





Pic 074  
Attic (above Kitchen)



Pic 075  
Attic (above Kitchen)





Pic 078  
Attic (above Kitchen)



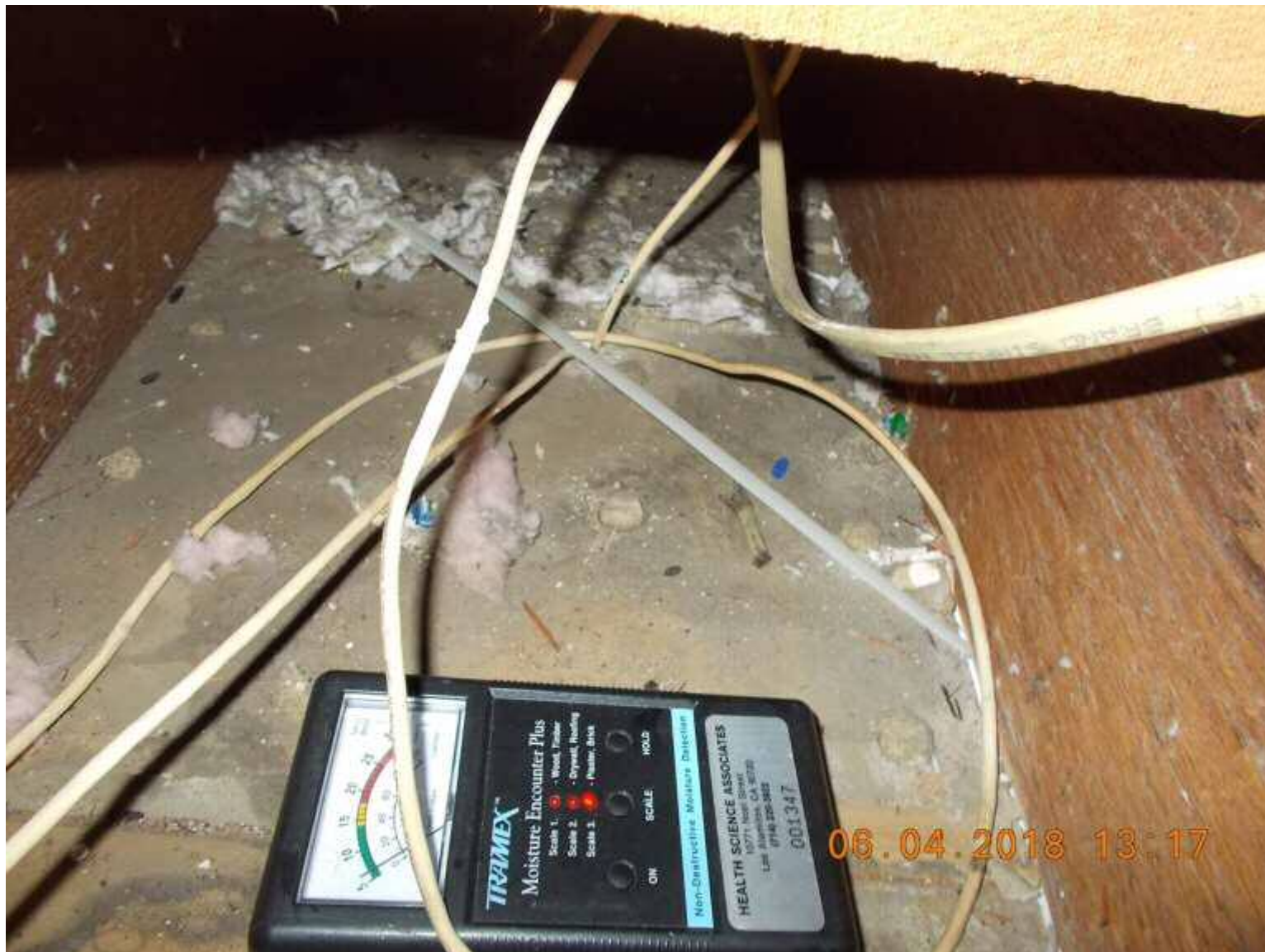


Pic 079  
Attic (above Kitchen)



Pic 080  
Attic (above Kitchen)



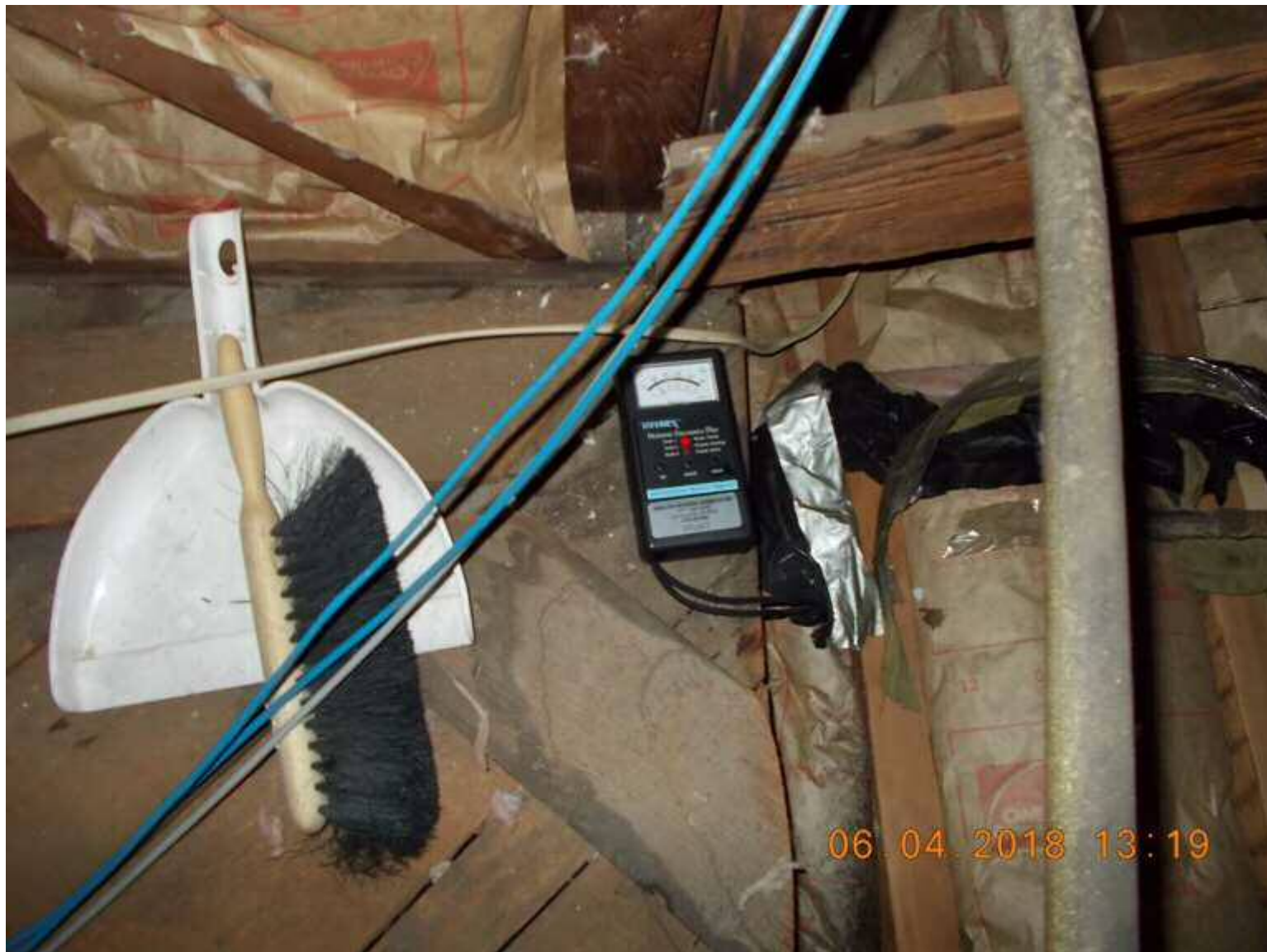


Pic 081  
Attic (above Kitchen)



Pic 083  
Attic (above Kitchen)





Pic 084  
Attic (above Kitchen)

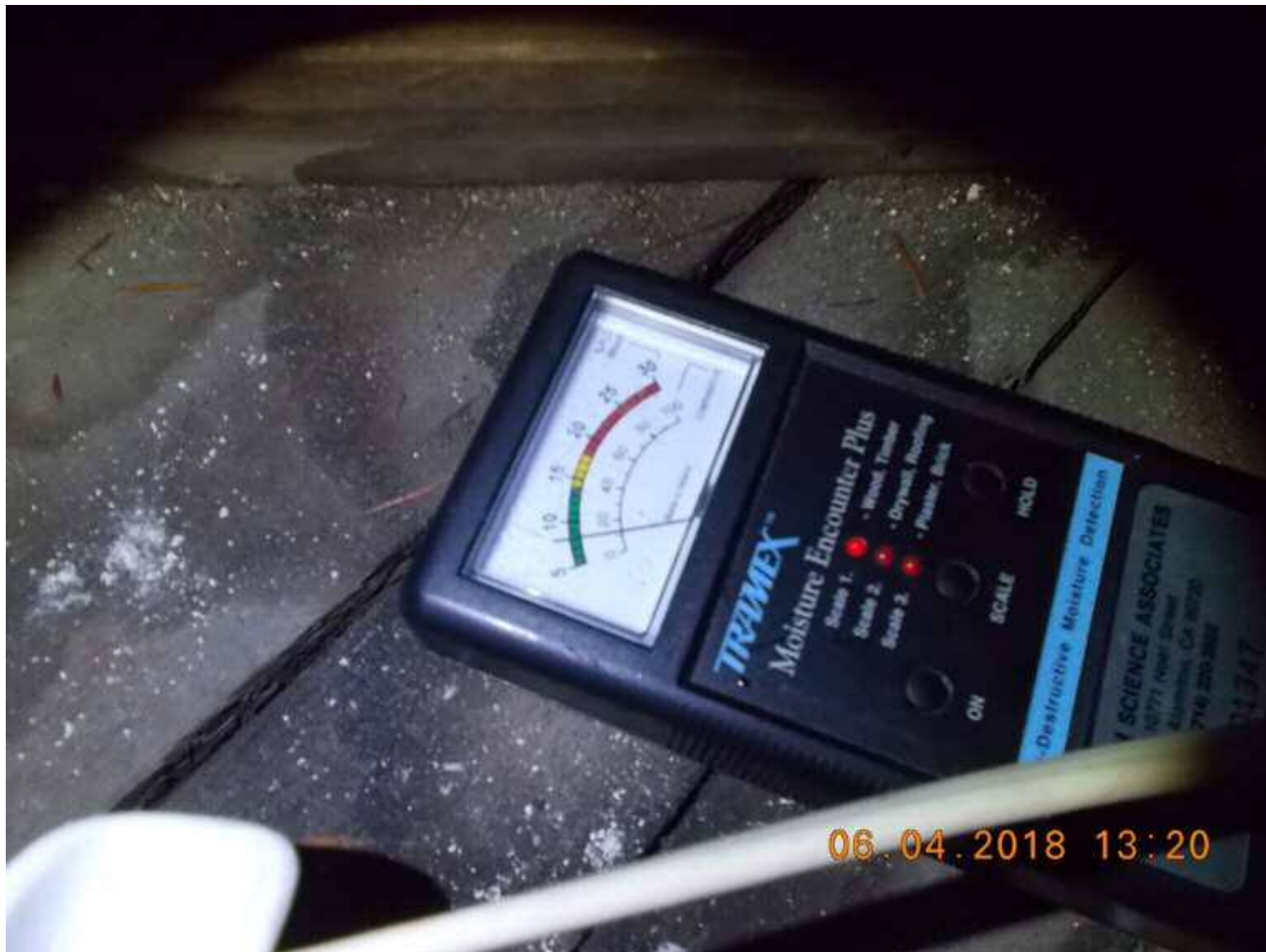




Pic 085



Pic 086  
Attic (above Kitchen)

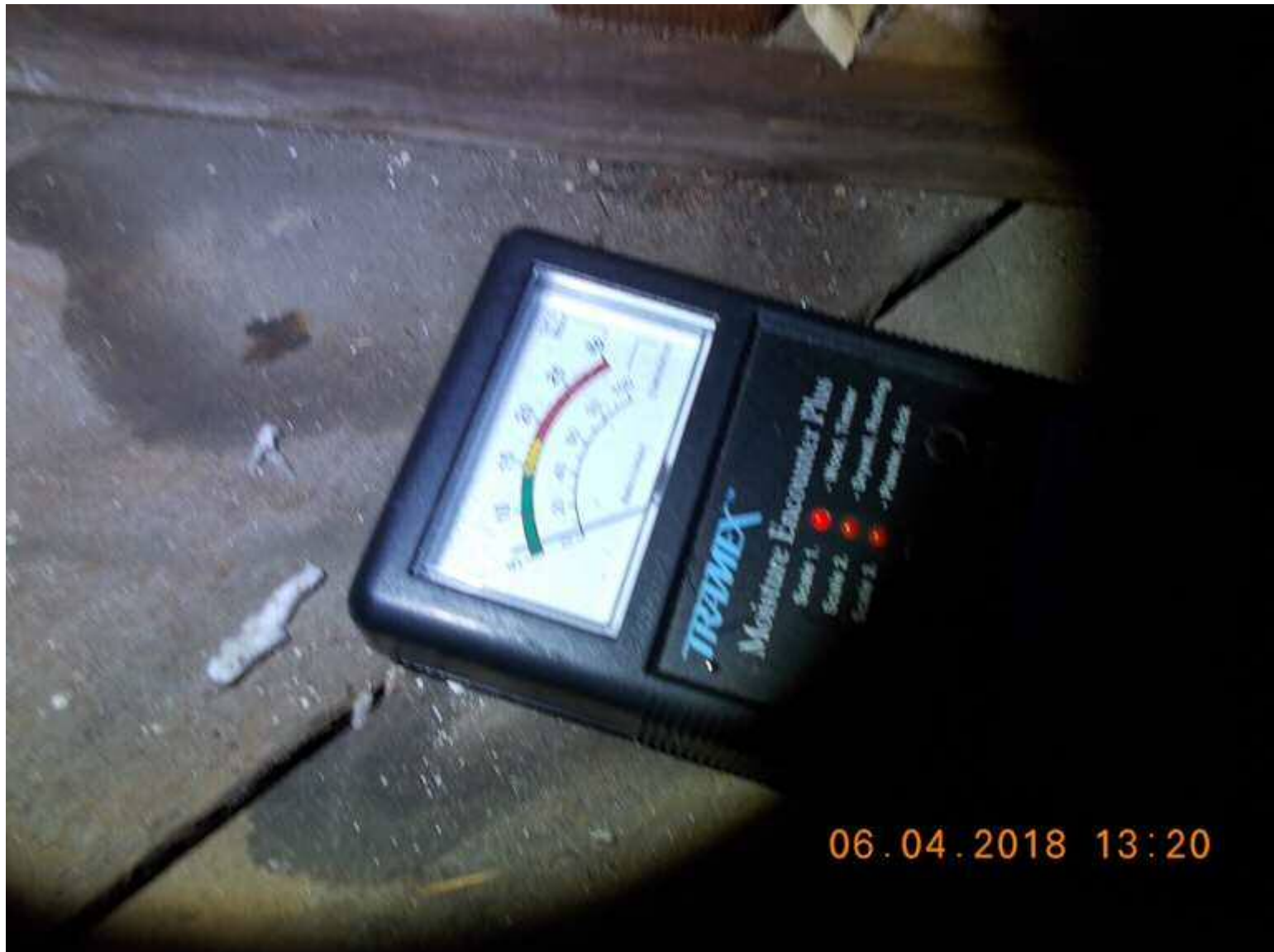


Pic 087  
Attic (above Kitchen)





Pic 088  
Attic (above Kitchen)



Pic 089  
Attic (above Kitchen)





Pic 092  
Exc. Rm. Vending Machine



Pic 093  
Exc. Rm. Vending Machine



Pic 094  
Exc. Rm. Vending Machine



Pic 095  
Kitchen Refrigerator



Pic 096  
2<sup>nd</sup> Floor Speaker System





Pic 097  
2<sup>nd</sup> Floor Speaker System



Pic 098  
2<sup>nd</sup> Floor Bedroom #2



Pic 099  
Floors



Pic 100  
Exc. Rm E. Wall



Pic 101  
Exc. Rm E. Wall



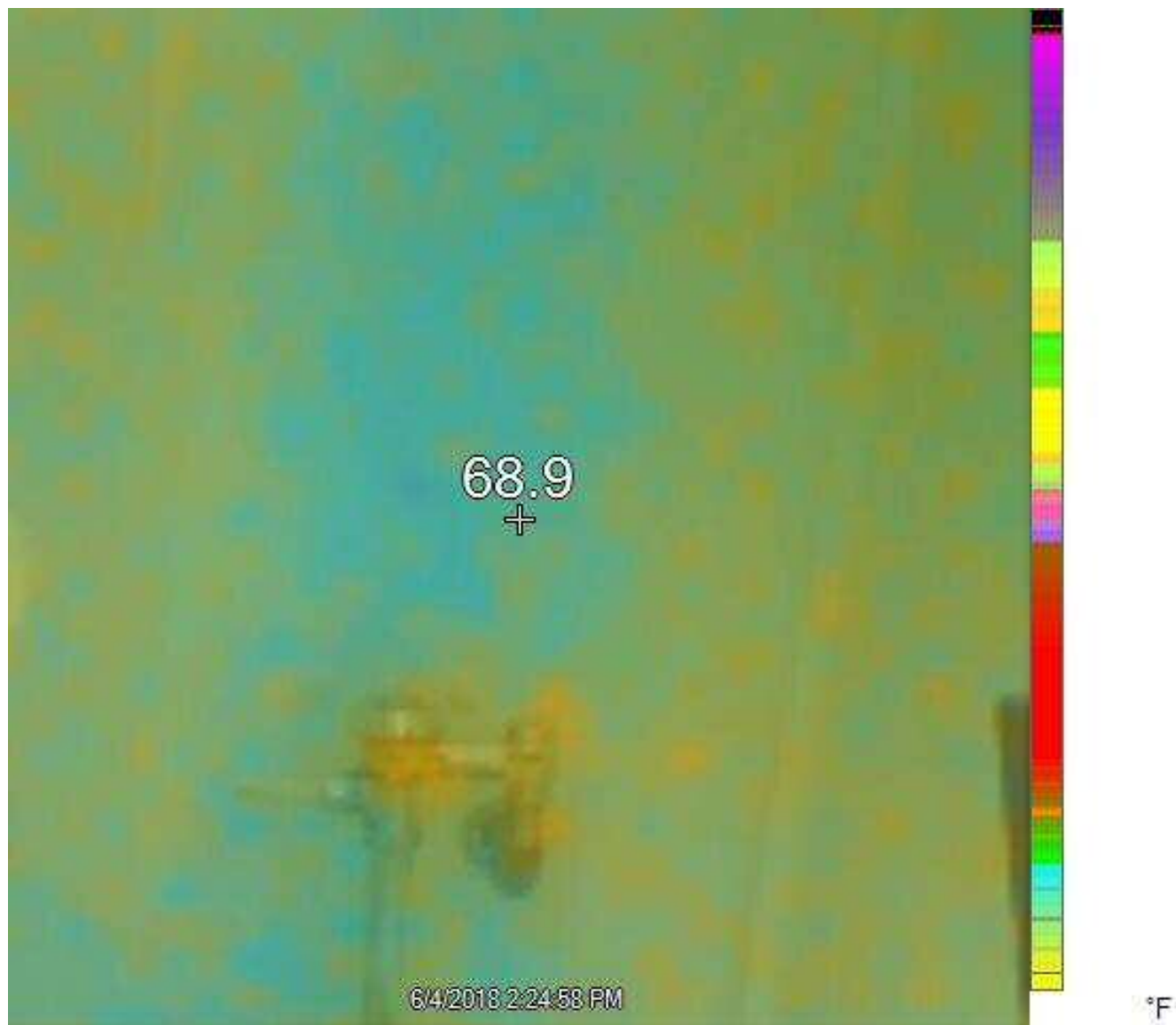


06.04.2018 13:55

Pic 102  
Kitchen Window Sill



VT\_0005T 1<sup>st</sup> Floor Bathroom (wet mops)



VT\_0001T 1<sup>st</sup> Floor Bathroom (possible moisture in blue)

*Quarterly Industrial Hygiene Inspection (11/5/2018)*



TECHNICAL AND ADVISORY SERVICES • ENVIRONMENTAL HEALTH AND SAFETY

## Quarterly Industrial Hygiene Inspection

Performed at

City of Long Beach  
Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, California 90807

Performed on October 11, 2018

Submitted To

Paul Alvarado  
Battalion Chief  
City of Long Beach  
Fire Department Headquarters  
3205 Lakewood Blvd  
Long Beach, CA 90808

HSA Project Number 180397LA

Report Date

November 5, 2018

Prepared By,

A handwritten signature in black ink, appearing to read 'Howard J. Ozar'.

Howard J. Ozar, CIH  
Industrial Hygienist

Reviewed By,

A handwritten signature in blue ink, appearing to read 'Joel I. Berman'.

Joel I. Berman, CIH, CSP, CAC, CIAQM  
Vice President





**EXECUTIVE SUMMARY**

On October 11, 2018, Health Science Associates (HSA) performed a Quarterly Industrial Hygiene Inspection at the City of Long Beach Fire Station #9 (fire station), located at 3917 Long Beach Blvd., Long Beach, California.

The purpose of this inspection was to perform the following: a visual inspection of the station to document general cleanliness of the surfaces in the building, an inspection of the attic space, the accessible roof areas, and the crawlspace under the first floor bathroom/shower area of the station, a moisture intrusion evaluation of the fire station using primarily a non-penetrating and penetrating moisture meter and an inferred camera (the intention is to detect water leaks as early as possible), use a particle counter to determine the concentration of airborne dust in the station as compared to the outdoor environment, utilize a photo ionization detector (PID) with sensitivity to detect volatile organic compounds (VOCs) in parts per billion (ppb) range to determine whether there is any measurable levels above background/outside, and then the monitoring results were then evaluated and compared with background levels, Indoor Air Quality (IAQ) guidelines recommended by the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE), and other guidelines and/or published references.

The background related to this fire station is that previously, there have been various IAQ and water intrusion issues in the fire station for an extended period of time. It was determined that there was fungal growth in the building and that the interior of the building had a heavy layer of built-up dust on various surfaces (see HSA project number reports 180034LA, 180081LA, and 180117LA). After the fungal remediation, HSA performed post fungal total spore air and surface remediation sampling to confirm that the remediation was successful and to document the cleanliness of the station (HSA Report 180117LA).

There appears to be continued visible improvement in the general cleanliness of the fire station. However, when inspecting horizontal surfaces “white glove tests” the following areas stood out as having more dirt/grime than others. They were the exercise room on top of the vending machine, file cabinet, sills, and TV; the Captains Office, 1<sup>st</sup> Floor Bathroom, the kitchen, garage, and the 2<sup>nd</sup> floor TV & Bedrooms. More surface cleaning is recommended in these rooms. See photographs.

The first quarterly inspection of the fire station was performed on June 4, 2018 (HSA Project Number 180259LA, dated July 12, 2018). During that inspection, there were three areas that were measured which showed an elevated moisture level using the Tramex moisture meter. These areas were still the 1<sup>st</sup> floor bathroom, captain’s office, and 2<sup>nd</sup> floor bedroom #3 and bathroom. HSA used a Delmhorst BD-2100 meter which penetrates inside the wood or plaster for conformation. The additional instrument together with visual inspection of the materials still suggests that false positives were determined during the previous inspection. HSA believes this

was due to the plaster and underlayment coating(s). Physically, it is difficult to penetrate plaster materials that have been dry with the pins of the Delmhorst BD-2100. If the pins easily penetrated the plaster it would lend more credence to the materials being previously wet. This was not the case. It was very difficult to penetrate the plaster, therefore, the materials were deemed to be dry.

Particle count levels in the kitchen, and 2nd Floor TV room were elevated as compared to other areas sampled inside of the fire station, but still below outside. The kitchen had finer particulate from 0.3 micrometers ( $\mu\text{m}$ ) to 5  $\mu\text{m}$  in size. The 2nd Floor TV room were larger particles, 10  $\mu\text{m}$  in size. It is recommended to re-clean these areas to see if the airborne levels are reduced during the next inspection. Specifically clean the chairs.

VOCs levels were within normal range. The area of the 2<sup>nd</sup> Floor bedroom #3 had the greatest level of measurable VOCs of 230 parts per billion (ppb). Normal levels range between 1,000 - 2,000 ppb; greater levels, trigger requirements to identify the sources and eliminate or reduce their VOC emission. For example, carpet glues or garage chemicals.

It is recommended to clear the storage closet under the hall stairwell to gain access to the area for future inspection (i.e., gain access).

The roof drains on the second floor balcony still need to be cleaned of leaves and other trash. This could cause pooling of water on the roof which could lead to future water leaks indoors and subsequently to possible mold growth.

In general, floors were noticeably cleaner than during our first site visits to fire this station.

This report was prepared for use by City of Long Beach in evaluating the subject location. The information contained within this report is as factual as possible and the opinions related herein are based on HSA's experience in similar investigations. No warranty, therefore, is made to any persons other than City of Long Beach regarding the conclusions or recommendations included within this report. HSA will not release copies to a third party without prior written consent of City of Long Beach.

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## 1.0 INTRODUCTION

- 1.1 On October 11, 2018, Health Science Associates (HSA) performed a Quarterly Industrial Hygiene Inspection at the City of Long Beach Fire Station #9 (fire station), located at 3917 Long Beach Blvd., Long Beach, California.
- 1.2 Project inspection and report preparation were performed by Howard J. Ozar, Certified Industrial Hygienist (CIH), assisted by Rene Medina, Industrial Hygiene Technician
- 1.3 Project set-up, management, overview, and report review were performed by Joel I. Berman, CIH, CSP, Certified Asbestos Consultant (CAC), Certified Indoor Air Quality Manager CIAQM, Vice President.
- 1.4 Purpose
  - 1.4.1 Perform a visual inspection of the station to document general cleanliness of the surfaces in the building.
  - 1.4.2 Perform an inspection of the attic space, the accessible roof areas, and the crawlspace under the first floor bathroom/shower area of the station.
  - 1.4.3 Perform a moisture intrusion evaluation of the fire station using primarily a non-penetrating moisture meter and an infrared camera. The intention is to detect water leaks as early as possible.
  - 1.4.4 Use a particle counter to determine the concentration of airborne dust in the station as compared to the outdoor environment.
  - 1.4.5 Utilize a photo ionization detector (PID) with sensitivity to detect volatile organic compounds (VOCs) in parts per billion (ppb) range to determine whether there is any measurable levels above background/outside.
- 1.5 The monitoring results were then evaluated and compare with background levels, Indoor Air Quality (IAQ) guidelines recommended by the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE), other guidelines, and published references.

## 2.0 BACKGROUND

- 2.1 The background related to this fire station is that previously, there have been various IAQ and water intrusion issues in the fire station for an extended period of

time. It was determined that there was fungal growth in the building and that the interior of the building had a heavy layer of built-up dust on various surfaces (see HSA project number reports 180034LA, 180081LA, and 180117LA).

- 2.2 After the fungal remediation. HSA performed post fungal total spore air and surface remediation sampling to confirm that the remediation was successful (HSA report 180117LA).
- 2.3 After the post fungal remediation sampling determined that the containments could be removed, then a complete and thorough cleaning of the fire station was performed to clean the years of settled dust on various surfaces. HSA also recommended that thorough cleaning be instituted in the fire station to prevent significant dust build-up from recurring.
- 2.4 A visual inspection was performed in the fire station after the thorough cleaning was completed (HSA Report 180117LA).
- 2.5 HSA was requested to perform quarterly inspections of the fire station to evaluate its condition. This is the second Quarterly Industrial Hygiene Inspection to continue and maintain clean conditions in the fire station since the last thorough cleaning.

### 3.0 ASSESSMENT

#### 3.1 Visual Inspection

- 3.1.1 A visual inspection of the station was conducted to document general cleanliness of surfaces. This was done by direct observation and by "white glove testing" to determine the extent of cleanliness.
- 3.1.2 The inspection also included the attic space, the accessible roof areas, and the crawlspace under the first floor bathroom/shower area of the station.

#### 3.2 Moisture Inspection

Moisture readings were taken from the drywall/plaster in various areas in the attic, in the closet under the stairwell, exercise room, bathrooms, captain's office, garage, movie room, bedrooms, and kitchen. All measurements indicated that the walls were dry. Measurements were taken with both a non-penetrating (non-destructive) and penetrating meters.



### 3.3 Particle Counter

3.3.1 Measurements of particle counts were collected from the exercise room, captain's office, kitchen, garage, outside front, locker area, shower/bathroom, movie room, #3 bedroom, outside roof, and the first floor hallway.

3.3.2 Measurements were analyzed by ranking particle counts from "1" greatest number of particles to "3" the third highest particle count. The indoor results were compared to other indoor locations and to the count determined to be present outdoors.

### 3.4 VOCs

3.4.1 Measurements of VOCs were collected from the exercise room, captain's office, kitchen, garage, outside front, locker area, shower/bathroom, movie room, #3 bedroom, outside roof, and hallway 1st floor.

3.4.2 Measurements were analyzed by ranking VOC concentrations from "1" greatest concentration in parts per million (ppm) to "3" the third highest concentration in ppm. They were also compared to outdoors levels.

### 3.5 Roof Inspection

Debris build-up was observed inside the drainage scuppers, particularly on the south side of the building.

## 4.0 METHODS

4.1 A RAE ppbRAE 3000 Photo Ionization Detector (PID) which can measure VOC levels in ppb was used to measure indoor and outdoor VOC levels.

4.2 A TSI 9306V Aerotrak handheld particle counter was used to measure indoor and outdoor particle levels.

4.3 A Tramex handheld moisture meter that was used to measure levels of moisture in building materials. This is a non-destructive type instrument that is based on surface resistance.

4.4 Delmhorst BD-2100 moisture meter to measure the moisture content of building materials. This meter measures moisture content of materials based on the

electrical resistance of the material. The unit has needle-nail like prongs, which are one half inch (1/2") long and are inserted into the material to be measured.

- 4.5 A FLIR infrared camera was used to measure surface temperature of various surfaces in the building. Cold surface areas are represented by "blue", which usually indicate wet areas due to the cooling effect of evaporating moisture on surfaces.

## 5.0 STANDARDS AND GUIDELINES

### 5.1 Occupational Exposures

To assess the extent of exposure, survey results are compared with regulatory standards and/or professionally recommended guidelines. For occupational exposures, reference values are published by the American Conference of Governmental Industrial Hygienists (ACGIH) and regulatory standards are set by both federal and state Occupational Safety and Health Administrations, OSHA and Cal/OSHA.

- 5.1.1 Both the regulatory standards and ACGIH guidelines are designed to protect workers from exposures to unhealthful concentrations of substances. However, the levels established by these bodies may not necessarily eliminate all effects for all people, e.g., mild irritations, response to odors, unique sensitivities, etc.

#### 5.1.2 California OSHA

Regulatory limits are described as permissible exposure limits (PELs), action levels (ALs), ceiling (C) limits, and/or short-term exposure limits (STELs).

#### 5.1.3 ACGIH

The ACGIH identifies its recommendations as threshold limit values (TLVs), ceiling (C) limits, and short-term exposure limits (STELs).

- 5.1.4 PELs, ALs, and TLVs are expressed as 8-hour TWAs for a normal eight-hour workday and a forty-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.<sup>1</sup>

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<sup>1</sup>2018 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, *American Conference of Governmental Industrial Hygienists*, p. 4.

Ceiling limits should never be exceeded, even for brief periods. STELs generally refer to concentrations to which workers can be exposed for a short period of time without suffering from irritation, chronic, or irreversible tissue damage or narcosis of sufficient degree to increase the likelihood of accidental injury, impair self-rescue, or materially reduce work efficiency, and provided that the daily TLV-TWA is not exceeded. The STEL is not a separate, independent exposure limit; rather, it supplements the TWA where there are recognized acute effects from a substance whose toxic effects are primarily of a chronic nature.

## 5.2 IAQ

5.2.1 Sick building syndrome (SBS) and IAQ concerns rarely, if ever, involve exposures to substances at PEL or TLV levels. The control of SBS and IAQ concerns in non-industrial environments are generally based on perceived air quality, ventilation systems' characteristics, operational performance, and quality of system maintenance (PM).

5.2.1.1 ASHRAE Standard 62.1 - 2010, "Ventilation for Acceptable Indoor Air Quality".<sup>2</sup>

5.2.1.1.1 The purpose of this standard is to specify minimum ventilation rates and other measures intended to provide IAQ that is acceptable to human occupants and that minimize adverse health effects. The standard is intended to be used as a guide to help improve IAQ in existing buildings or a design standard in construction specifications.

5.2.1.1.2 One method to determine acceptable air quality is achieved within the space by controlling identified contaminants of concern (COC) and comparison of their concentration with IAQ references (normal or trigger/action responses); the generally perceived air quality by occupant percentage (if poor then increase fresh air flow), mass balance analysis (air dilution) to determine proper fresh minimum requirements, and/or a variation of Ventilation Rate Procedures and IAQ Procedures.

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<sup>2</sup>American Society of Heating, Refrigerating, and Air-Conditioning Engineers, "Ventilation for Acceptable Indoor Air Quality", ASHRAE 62.1-2010, Atlanta, GA, *American Society of Heating, Refrigerating, and Air-Conditioning Engineers*, 2010.

5.2.2 The following table represents many of the IAQ reference levels that are typically compared with measured contaminate levels in IAQ surveys. Typical indoor concentrations are provided along with levels above identified trigger concentrations indicating the need for further investigations.

Test	Typical Indoor Concentration	Trigger Concentration
Asbestos	<0.01 f/cc	>0.01 f/cc
Bioaerosols	Varies	2-3 Times Greater than Other Spaces or Outdoors
Carbon Dioxide	400-1000 ppm	800 ppm 700 ppm +Background
Carbon Monoxide	1-3 ppm	>5 ppm
Formaldehyde	0.01-0.05 ppm	>0.05 ppm
Moisture	Varies	40- 60 %
Nitrogen Dioxide	0.01-0.05 ppm	>0.05 ppm
Odors	None	Detectable for Extended Time
Ozone	0.01-0.02 ppm	>0.05 ppm
Particles (Dust)	<50 µg/m <sup>3</sup> (total)	>50 µg/m <sup>3</sup>
Radon	<0.5 pCi/L	>4 pCi/L
VOCs	<300 µg/m <sup>3</sup> 1-2 ppm	300 µg/m <sup>3</sup> to 3000 µg/m <sup>3</sup> Depending on Chemicals
Ref. - IAQ and HVAC Workbook, 4th Edition, Revised and Updated 2001, D.Jeff Burton, CIH,PE, CSP, ISBN 1-883992-16-8, Contaminant Concentration Checklist, p. A-27		

*Table: Indoor Air Quality Typical and Trigger Levels*

## 6.0 SURVEY RESULTS, DISCUSSION, AND RECOMMENDATIONS

6.1 The results tables relating to this survey are listed below.

6.1.1 Table I - Visual Inspection.

6.1.2 Table II - Moisture Meter.

6.1.3 Table III - Particle Counter.

6.1.4 Table IV - Volatile Organic Compounds.

6.2 Appendices

6.2.1 Instrument calibration certificates are provided in APPENDIX I - Instrument Calibration Certificates.

6.2.2 Photographs are provided in APPENDIX II - Photographs.

## 6.3 Findings

- 6.3.1 There appears to be continued visible improvement in the general cleanliness of the fire station. However, when inspecting horizontal surfaces “white glove tests” the following areas stood out having more dirt/grime than others. They were the exercise room on top of the vending machine, file cabinet, sills, and TV, the Captains Office, 1<sup>st</sup> Floor Bathroom, the kitchen, garage, and the 2<sup>nd</sup> floor TV & Bedrooms. More surface cleaning is recommended in these rooms. See photographs which depict these conditions.
- 6.3.2 There were three areas that were measured which showed an elevated moisture level of moisture using the Tramex moisture meter from the previous quarterly inspection. These areas were still the 1<sup>st</sup> floor bathroom, captain’s office, and 2<sup>nd</sup> floor bedroom #3 and bathroom. During this inspection, HSA also used a Delmhorst BD-2100 meter which penetrates inside the material for conformation. The additional instrument together with visual inspection of the materials still suggests false positives. HSA believes it is due to the plaster and underlayment coating(s). Physically the plaster is hard to touch and difficult to penetrate with the Delmhorst BD-2100 pins. If the pins easily penetrated the plaster it would lend more credence to being wet. This was not the case. It was very hard material and therefore, therefore, the material was deemed to be dry.
- 6.3.3 Particle count levels in the kitchen, and 2nd Floor TV room were elevated as compared to other areas sampled indoors, but were below the outdoor levels. The kitchen had finer particulate from 0.3 micrometers ( $\mu\text{m}$ ) to 5  $\mu\text{m}$  in size. The 2nd Floor TV room were larger, 10  $\mu\text{m}$  in size. It is recommended to re-clean these areas to see if the airborne levels are reduced during the next quarterly inspection. The 2<sup>nd</sup> floor sofas chairs may account for the larger particle sizes. Also, the roof door was left open. HSA closed the door during testing, however, this may also explain particle larger particle sizes in the area.
- 6.3.4 VOCs levels were within normal range. The area of the 2<sup>nd</sup> Floor bedroom #3 had the greatest level of measurable VOCs at 230 ppb. Normal levels range between 1,000 - 2,000 ppb; greater levels, trigger requirements to identify the sources and eliminate or reduce their VOC emission. For example, carpet glues or garage chemicals. The emissions exhaust connect in the garage was found disconnected from a fire truck. The exhaust connects should be



used to reduce VOCs, carbon monoxide, and particulate contamination.

- 6.3.5 Prior to our next inspection, it is recommended to clean the storage closet under the hall stairwell to gain access to crawlspace for future inspection (i.e., gain access). It is suggested to remove and replace the bottom shelf of the 1<sup>st</sup> floor bathroom supply cabinet. The wood is deteriorated and was another location showing false positives for elevated levels of moisture.
  - 6.3.6 The roof drains on the second floor balcony need to be cleaned of leaves and other trash. This could cause future water leaks indoors and lead to subsequent mold growth.
  - 6.3.7 The attic insulation was questioned whether or not it contained asbestos and therefore was not inspected. The City of Long Beach representative was advised of the possibility. The representative said that a records search will be done to see if the insulation had been tested. If records indicate no asbestos, the inspection of the attic will resume next quarter otherwise it would be prudent to test this material.
  - 6.3.8 In general, floors were noticeably cleaner and there may have been fresh paint in some areas.
- 6.4 This report was prepared for use by City of Long Beach in evaluating the subject location. The information contained within this report is as factual as possible and the opinions related herein are based on HSA's experience in similar investigations. No warranty, therefore, is made to any persons other than City of Long Beach regarding the conclusions or recommendations included within this report. HSA will not release copies to a third party without prior written consent of City of Long Beach.

Table I - Visual Inspection

City of Long Beach Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, California 90807  
October 11, 2018

Description	Evaluation	Comment
General Areas	Satisfactory	
Crawlspace	No Access	Recommend clearing closet/access under stairwell of all boxes and stored material for next inspection.
Attic Space	Satisfactory	Noticeable difference. Much cleaner/less dust.
Under Stairwell Closet	No Access	Recommend clearing closet/access under stairwell of all boxes and stored material.
Exercise Room	Improvement	Horizontal Surfaces Dusty/Grimy (white glove tests)
1st Floor Bathroom Shower Room	Satisfactory	Cabinet bottom shelf deteriorated.
Captain's Office	Satisfactory	
Garage	Satisfactory	
1st Floor Hallway	Satisfactory	
2nd Floor TV & Bedrooms	Improvement	Horizontal Surfaces Dusty/Grimy (white glove tests)
Kitchen	Improvement	Horizontal Surfaces Dusty/Grimy (white glove tests)
Roof Drain	Improvement	Plugged with Debris

Table II - Moisture Meter

City of Long Beach Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, California 90807  
October 11, 2018

Description	Evaluation	Comment
General Areas	Satisfactory	
Crawlspace	No Access	Recommend clearing closet/access under stairwell of all boxes and stored material.
Attic Space	N/A	Delayed - Records Research ongoing (insulation suspect of asbestos) by City of Long Beach
Under Stairwell Closet	No Access	Recommend clearing closet/access under stairwell of all boxes and stored material.
Exercise Room	Satisfactory	
1st Floor Bathroom Shower Room	Satisfactory	Based on Tramex, Delmhorst BD-2100, Infrared Photography, and physical inspection.
Captain's Office	Satisfactory	Based on Tramex, Delmhorst BD-2100, Infrared Photography, and physical inspection.
Garage	Satisfactory	
1st Floor Hallway	Satisfactory	
2nd Floor TV & Bedrooms	Satisfactory	Based on Tramex, Delmhorst BD-2100, Infrared Photography, and physical inspection.
Kitchen	Satisfactory	
<b>Instrumentation:</b> Tramex Moisture Encounter Plus		



Table III - Air Sampling Results for Particle Counter

City of Long Beach Fire Station #9  
 3917 Long Beach Blvd.  
 Long Beach, California 90807  
 October 11, 2018

Particle Size Distribution	Exercise Room	Captains Office	Kitchen	Garage	Outside Front	Locker Area	Shower/Bathroom	TV Room	Rm. #3 Bedroom	Outside Roof	Hallway 1st Floor	Rank Order (1, 2, and 3)
0.3 µm	426020	417830	478240	496670	689040	420425	453440	378530	370840	291340	432770	1 Outside F 2 Garage 3 Kitchen
0.5 µm	88940	96130	101140	146410	173040	96043	98620	82390	78160	98400	95640	1 Outside F 2 Garage 3 Kitchen
1.0 µm	37010	31560	28210	63750	73180	31398	31900	24210	21410	42430	27940	1 Outside F 2 Garage 3 Outside R
3.0 µm	2860	2620	1920	6350	7760	3303	2230	2160	2410	3940	2040	1 Outside F 2 Garage 3 Outside R
5.0 µm	940	820	550	2110	2640	985	580	790	950	1100	430	1 Outside F 2 Garage 3 Outside R
10 µm	150	110	120	290	320	179	120	200	140	150	70	1 Outside F 2 Garage 3 TV Room

**Abbreviation:** µm=micro meters



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Table IV - Air Sampling Results for Volatile Organic Compounds

City of Long Beach Fire Station #9  
 3917 Long Beach Blvd.  
 Long Beach, California 90807  
 October 11, 2018

Description	Exercise Room	Captains Office	Kitchen	Garage	Outside Front	Locker Area	Shower/Bathroom	TV Room	Rm. #3 Bedroom	Outside Roof	Hallway 1st Floor	Rank Order (1, 2, and 3)
VOCs (ppb)	210	170	156	0	0	265	260	215	230	85	165	1 Locker 2 Shower/ Bth 3 Rm. #3 Bd
<b>Abbreviation:</b> ppb=parts per billion; Normal Levels = 1-2 ppm (1000-2000 ppb)												



## **APPENDIX I - Instrument Calibration Certificates**



# CERTIFICATE OF CALIBRATION

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

ENVIRONMENT CONDITION		
TEMPERATURE	74.0 (23.3)	°F (°C)
RELATIVE HUMIDITY	52	%RH
BAROMETRIC PRESSURE	28.94 (980.0)	inHg (hPa)

MODEL	9306-V
SERIAL NUMBER	93060910002
CUSTOMER INST ID	

☒ AS LEFT  
☐ AS FOUND

☒ IN TOLERANCE  
☐ OUT OF TOLERANCE

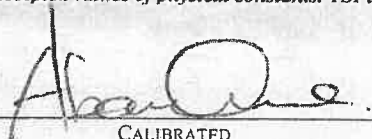
## AEROTrak CALIBRATION KIT

MEASUREMENT VARIABLE	SYSTEM ID	DATE LAST CALIBRATED	CALIBRATION DUE DATE
FLOW METER	E003739	05-15-2018	11-30-2018
7201-02F	E004434	03-07-2018	09-30-2018
FLOW METER	E005682	05-15-2018	05-31-2019

## PARTICLE STANDARDS

PARTICLE SIZE	STANDARD UNCERTAINTY	STANDARD DEVIATION	LOT NO.	EXPIRATION DATE
0.303 µm	0.003 µm	0.0047 µm	174664	10/31/2019
0.508 µm	0.004 µm	0.0085 µm	185892	6/30/2020
0.994 µm	0.0075 µm	0.010 µm	193291	1/31/2021
2.92 µm	0.015 µm	0.03 µm	181443	2/28/2020
5.020 µm	0.015 µm	0.06 µm	179268	1/31/2020
9.850 µm	0.03 µm	0.13 µm	196944	4/30/2021

TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to the United States National Institute of Standards and Technology (NIST) or has been verified with respect to instrumentation whose accuracy is traceable to NIST, or is derived from accepted values of physical constants. TSI is registered to ISO-9001:2015.

  
CALIBRATED

August 9, 2018

DATE



# CERTIFICATE OF CALIBRATION

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

## SIZE CALIBRATION AND VERIFICATION OF SIZE SETTING

NOMINAL PARTICLE SIZE	GAIN STAGE	DIGITAL CUTPOINT	EXPANDED UNCERTAINTY
0.3 $\mu\text{m}$	A	0	4.1%
0.5 $\mu\text{m}$	A	385	3.9%
1 $\mu\text{m}$	B	2	3.9%
3 $\mu\text{m}$	B	106	3.7%
5 $\mu\text{m}$	B	290	3.6%
10 $\mu\text{m}$	B	850	3.6%

## COUNTING EFFICIENCY

PARTICLE SIZE	ACTUAL	ALLOWABLE RANGE	PASS/FAIL
0.3 $\mu\text{m}$	50%	50% $\pm$ 20%	Pass
0.5 $\mu\text{m}$	91%	100% $\pm$ 10%	Pass

## FALSE COUNT RATE

SAMPLE TIME (MIN)	SAMPLED (L)	MEASURED COUNTS (#)	CONCENTRATION ( $\#/M^3$ )	95% UCL ( $\#/M^3$ )	ALLOWABLE RANGE ( $\#/M^3$ )	PASS/FAIL
30	84	0	0.00	35.7	$\leq 1.4$	Pass

## SAMPLING FLOW RATE (L/MIN)

NOMINAL	ACTUAL	ERROR	ALLOWABLE RANGE	PASS/FAIL
2.83	2.80	-1.1 %	$\pm 5\%$	Pass

## SAMPLING TIME †

MEASURED	ALLOWABLE RANGE	PASS/FAIL
$< \pm 0.1\%$	$\pm 1\%$	Pass

## RESPONSE RATE †

MEASURED	ALLOWABLE RANGE	PASS/FAIL
0.004%	$\leq 0.5\%$	Pass

## MAXIMUM PARTICLE CONCENTRATION †

173000000  $\#/m^3$  @10% Coincidence Loss

† Tested and verified during product development

## CALIBRATION INTERVAL

CALIBRATION DATE	EXPIRATION DATE
August 9, 2018	August 9, 2019



# Calibration Certificate

rev 8/9/11

Work Order No.: SE-060966

Date of Service: 10/10/2018

Unit Under Test: RAE ppbRAE 3000 PID

Asset No.: FA00372

Technician: Christine Tong

Initials: CXT

Serial No: 594-903013

TEST	Specification	Result
Standard Calibration	Pass/Fail	PASS

TEST STANDARDS USED:

DESCRIPTION	LOT NO./EXPIRATION DATE	QUANTITY
10ppm Isobutylene in Air	Lot No. TFBI-248-10-7 Exp. 05/15/2022	1

TEST EQUIPMENT USED:

DESCRIPTION	ASSET NO.	SERIAL NO.	DATE OF LAST CAL	DATE CAL DUE

Test Equipment and standards are traceable to National standards.

Installed 10.6 eV lamp

## **APPENDIX II - Photographs**





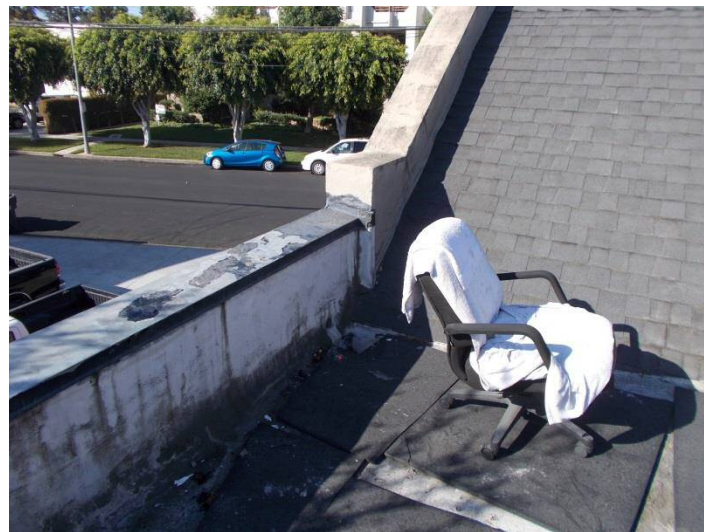
DSCN2649 Roof Drains



DSCN2650 Roof Drains



DSCN2651 Roof Drains



DSCN2652 Roof Drains



DSCN2653 Calibration/Battery Good when 12.0 is Displayed



DSCN2654 Attic Insulation (Concern whether or not it contained Asbestos), Records Research to be Conducted



DSCN2655 Material Blocking Inspection of Crawlspace



DSCN2656 Dirt/Grim Exercise Room on Vending Machine





DSCN2657 Dirt/Grim Exercise Room on Vending Machine



DSCN2658 Dirt/Grim Exercise Room on Ice Machine



DSCN2659Dirt/Grim Exercise Room on Ice Machine



DSCN2660 Dirt/Grim Exercise Room on TV



DSCN2661 Dirt/Grim Exercise Room on TV



DSCN2662Dirt/Grim Exercise Room on Sill



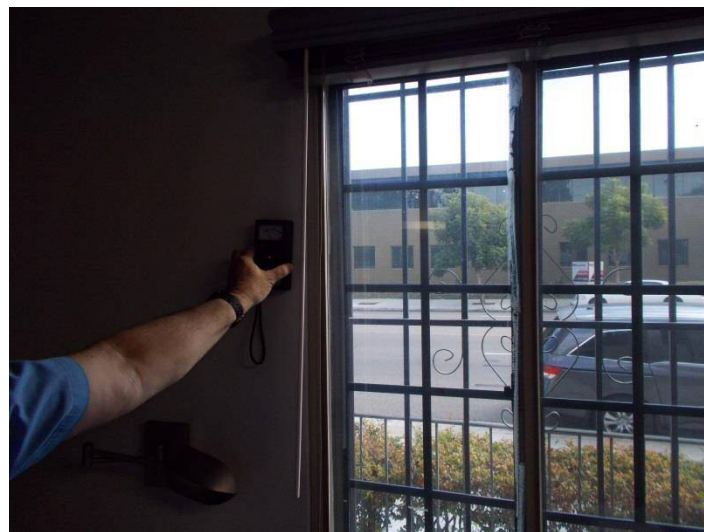
DSCN2663 Dirt/Grim Exercise Room on Sill



DSCN2664 Reference Dry Area



DSCN2666 Captain's Office 20%



DSCN2667



DSCN2669 Reference 35.4%



DSCN2670 Zero Percent





DSCN2671 Same



DSCN2672 Captain's Office Bathroom 0%



DSCN2673 Captain's Office Bathroom 22%



DSCN2675 Captain's Office Bathroom 40%



DSCN2676 Captain's Office Bathroom 0% (Dry)



DSCN2677 Captain's Office Bathroom 4.5% (Dry)  
Confirmation



DSCN2678 Area where False Positives ID



DSCN2680 Area where False Positives ID



DSCN2681 Area where False Positives ID



DSCN2682 Captain's Office Dirt/Grime



DSCN2683 Captain's Office Dirt/Grime



DSCN2684 1<sup>st</sup> Fl Bathroom, Reference (Dry Area)





DSCN2685 1<sup>st</sup> Fl Bathroom, Confirmation Area (Dry)



DSCN26871<sup>st</sup> Fl Bathroom, Confirmation Area (Dry)



DSCN2688 1<sup>st</sup> Fl Bathroom, Reference Area (Dry)



DSCN26891<sup>st</sup> Fl Bathroom, Confirmation Area (Wet), Hard to Touch or Penetrate with Pins



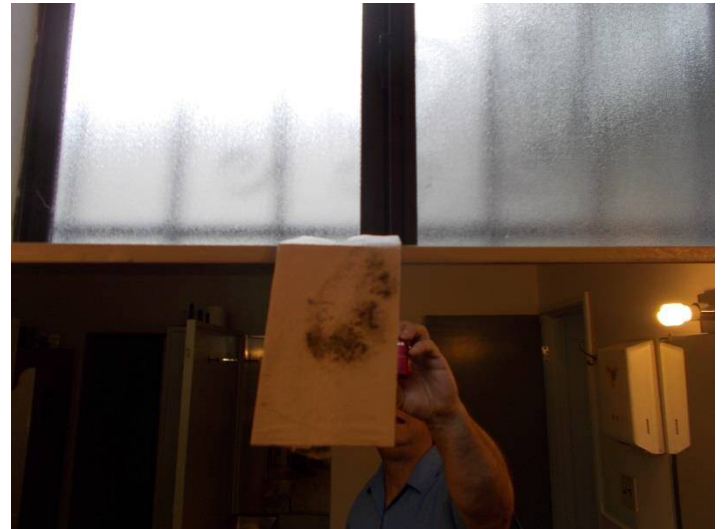
DSCN2695 1<sup>st</sup> Fl Bathroom, Reference Area (Dry)



DSCN2696 1<sup>st</sup> Fl Bathroom, Confirmation Area (Dry)



DSCN2699 Consider Replacing



DSCN2700 1<sup>st</sup> Fl Bathroom, Dirt/Grime





DSCN2701 1<sup>st</sup> Fl Bathroom, Dirt/Grime



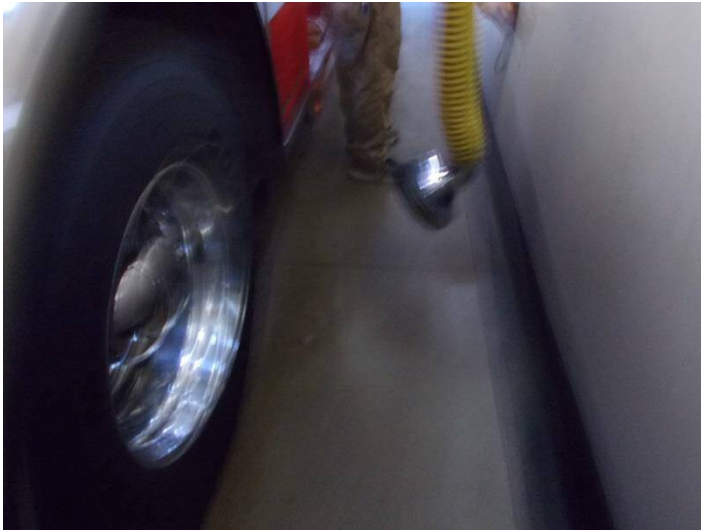
DSCN2702 1<sup>st</sup> Fl Bathroom, Dirt/Grime



DSCN2703



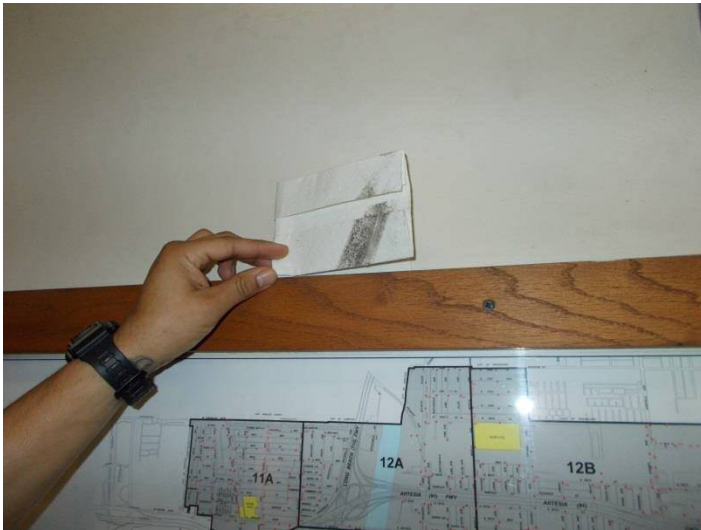
DSCN2704



DSCN2705 Un-Hooked Emission Exhaust



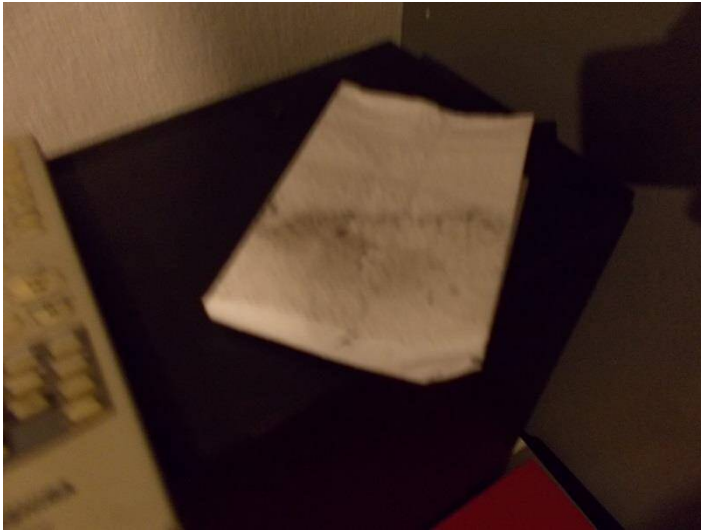
DSCN2708



DSCN2710 Garage, Dirt/Grime



DSCN2711 Garage, Dirt/Grime



DSCN2712 2<sup>nd</sup> FI TV Room, Dirt/Grime



DSCN2713 2<sup>nd</sup> FI TV Room, Dirt/Grime



DSCN2715 2<sup>nd</sup> FI TV Room, Dirt/Grime



DSCN2716 2<sup>nd</sup> FI TV Room, Dirt/Grime



DSCN27172<sup>nd</sup> FI TV Room, Room #1, Dirt/Grime

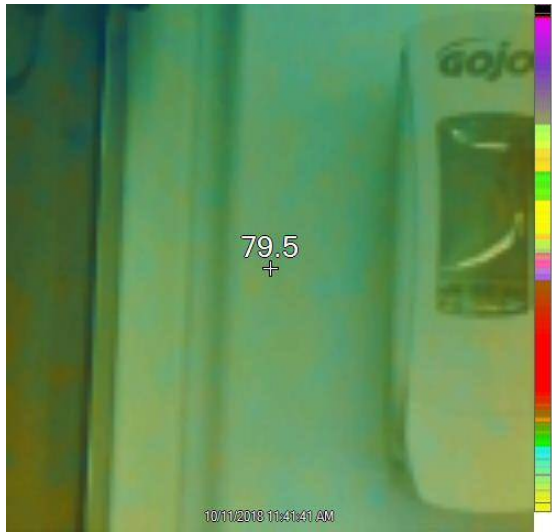
Text Box



DSCN27182<sup>nd</sup> FI TV Room, Room #1, Dirt/Grime

Text Box





VT\_0004T Infrared Captain's Office Bathroom



VT\_0007T Infrared Captain's Office



VT\_0010T Infrared 1<sup>st</sup> Fl Bathroom



VT\_0011T Infrared 1<sup>st</sup> Fl Bathroom





VT\_0012T Infrared 1<sup>st</sup> Fl Bathroom



VT\_0013T Infrared 1<sup>st</sup> Fl Bathroom

*Quarterly Industrial Hygiene Inspection (2/22/2019)*

## Quarterly Industrial Hygiene Inspection

Performed at

City of Long Beach Fire Station #9  
3917 Long Beach Boulevard  
Long Beach, California 90807

Performed on January 14, 2019

Submitted To

Cory Fackiner, Batalion Chief  
City of Long Beach  
3205 Lakewood Boulevard  
Long Beach, California 90808

HSA Project Number 190101LA

Report date February 22, 2019

Prepared by:



Howard J. Ozar, CIH  
Industrial Hygienist

Reviewed by:



Joel I. Berman, CIH, CSP, CAC, CIAQM  
Vice President



## EXECUTIVE SUMMARY

On January 14, 2019, Health Science Associates (HSA), performed a Quarterly Industrial Hygiene Inspection at the City of Long Beach Fire Station #9 located at, 3917 Long Beach Boulevard, in Long Beach, California.

The purpose of this inspection was to perform the following:

Perform a visual inspection of the station to document general cleanliness of the surfaces in the building.

Perform an inspection of the attic space, the accessible roof areas, and the crawlspace under the first floor, bathroom/shower area of the station.

Perform a moisture intrusion evaluation of the Fire Station using primarily a non-penetrating moisture meter and an infrared camera. The intention is to detect water leaks as early as possible.

Use a particle counter to determine the concentration of airborne dust in the Fire Station, as compared to the outdoor environment.

Utilize a photo ionization detector (PID) with sensitivity to detect volatile organic compounds (VOCs) in parts per billion (ppb) range, to determine whether there is any measurable levels above background/outside.

The background related to this Fire Station is that previously, there have been various indoor air quality (IAQ) and water intrusion issues for an extended period of time. It was determined that there was fungal growth in the building and that the interior of the building had a heavy layer of built-up dust on various surfaces (see HSA Reports 180034LA, 180081LA, and 180117LA.)

After the fungal remediation, HSA performed post fungal total spore air and surface remediation sampling, to confirm that the remediation was successful (HSA Report 180117LA).

After the post fungal remediation sampling determined that the containments could be removed, a complete and thorough cleaning of the Fire Station was performed, in order to clean the years of settled dust on various surfaces. HSA also recommended that a thorough cleaning be instituted in the Fire Station in order to prevent significant dust build-up from recurring.

A visual inspection was performed in the Fire Station after the thorough cleaning was completed (HSA Report 180117LA).

HSA was requested to perform quarterly inspections of the Fire Station to evaluate it's condition. This is the fourth Quarterly Industrial Hygiene Inspection that has been conducted in order to maintain clean conditions in the Fire Station since the previous thorough cleaning.

## Findings

The general cleanliness of the Fire Station was not impressive. When inspecting horizontal surfaces “white glove tests”, the following areas stood out as having more dirt/grime than others; the Exercise Room, on top of the vending machine and sills, the Main Hallway picture frames, the Captains Office, and the second Floor Bedroom #1 and Bedroom #3. Additional surface cleaning is recommended in these areas. (See photographs in Appendix III which depict these conditions.)

There were two areas that were measured which showed visible water leakage (as it was raining during the inspection). The First Floor Sleeping Quarters in Bedroom #3 and the Second Floor Sleeping Quarters in Bedroom #1. These were serious leaks where water was actually observed dripping inside. The windows should be inspected and repaired. Also, the Firemen raised concern of the blistering wall paint in the second Floor Bedroom #3 (historic in nature). Moisture measurements were dry, however, blistering paint areas around the windows should be repaired as this is not normally an acceptable living condition (See photographs in Appendix III).

Particle count levels indoors were elevated as compared to outdoors. The First Floor Bathroom and Shower Room were elevated for larger particles. The most likely cause was due to shower use just prior to the inspection (i.e. suspended moisture droplets). Overall particle levels were down compared to the previous quarterly inspection (HSA Report 180397LA, October 11, 2018).

VOC levels were within normal range. Overall VOC levels were also down compared to the previous quarterly inspection. One note, however, was that the emissions exhaust connect-up in the garage was observed disconnected from a fire truck. The exhaust connections should be used in order to reduce VOCs, carbon monoxide, and particulate contamination of the occupied spaces.

Inspection of the crawl space revealed that the south wall footing was leaking rain water. Also, as a result, the soil was moist in areas (See photographs). These conditions can promote mold growth and should be repaired. Photographs show puddling outside the south wall (See photographs). Better drainage from rain water is recommended.

It was suggested to remove and replace the bottom shelf of the first floor bathroom supply cabinet. The wood is deteriorated and was one of the locations showing false positives for elevated levels of moisture. This was not completed and is still recommended to be removed and replaced.

The roof drains on the Second Floor Balcony still need to be cleaned of leaves and other trash. This could cause future indoor water leaks and lead to subsequent mold growth (See photographs in Appendix III).

The attic insulation was questioned whether or not it contained asbestos. Samples were collected and results show no asbestos detected (i.e. ND). Inspection of the attic space will resume during the next quarterly inspection.

In general, the Fire Station needs cleaning and repairs as noted.



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## 1.0 INTRODUCTION

- 1.1 On January 14, 2019, Health Science Associates (HSA) performed a Quarterly Industrial Hygiene Inspection at the City of Long Beach Fire Station #9 located at, 3917 Long Beach Boulevard, in Long Beach, California.
- 1.2 Project inspection and report preparation were performed by Howard J. Ozar, Certified Industrial Hygienist (CIH), assisted by Rene Medina, Industrial Hygiene Technician.
- 1.3 Project set-up, management, overview, and report review were performed by Joel I. Berman, CIH, CSP, Certified Asbestos Consultant (CAC), Certified Indoor Air Quality Manager CIAQM, Vice President.
- 1.4 Purpose
  - 1.4.1 Perform a visual inspection of the Fire Station to document general cleanliness of the surfaces in the building.
  - 1.4.2 Perform an inspection of the attic space, the accessible roof areas, and the crawlspace under the first floor bathroom/shower area of the Fire Station.
  - 1.4.3 Perform a moisture intrusion evaluation of the Fire Station using primarily a non-penetrating moisture meter and an infrared camera. The intention is to detect water leaks as early as possible.
  - 1.4.4 Use a particle counter to determine the concentration of airborne dust in the station as compared to the outdoor environment.
  - 1.4.5 Utilize a photo ionization detector (PID) with sensitivity to detect volatile organic compounds (VOCs) in parts per billion (ppb) range to determine whether there is any measurable levels above background/outside.
- 1.5 The monitoring results were then evaluated and compare with background levels, Indoor Air Quality (IAQ) guidelines recommended by the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE), other guidelines, and published references.

## 2.0 BACKGROUND

- 2.1 The background related to this Fire Station is that previously, there have been various Indoor Air Quality (IAQ) and water intrusion issues in the Fire Station for an extended period of time. It was determined that there was fungal growth in the building and that the interior of the building had a heavy layer of built-up dust on various surfaces (see HSA project number reports 180034LA, 180081LA, and 180117LA).

- 2.2 After the fungal remediation, HSA performed post fungal total spore air and surface remediation sampling to confirm that the remediation was successful (HSA report 180117LA).
- 2.3 After the post fungal remediation sampling determined that the containments could be removed, then a complete and thorough cleaning of the Fire Station was performed to clean the years of settled dust on various surfaces. HSA also recommended that thorough cleaning be instituted in the Fire Station to prevent significant dust build-up from recurring.
- 2.4 A visual inspection was performed in the Fire Station after the thorough cleaning was completed (HSA Report 180117LA).
- 2.5 HSA was requested to perform quarterly inspections of the Fire Station to evaluate its condition. This is the fourth Quarterly Industrial Hygiene Inspection to be performed.

### 3.0 ASSESSMENT

#### 3.1 Visual Inspection

- 3.1.1 A visual inspection of the station was conducted to document general cleanliness of surfaces. This was done by direct observation and by "white glove testing" to determine the extent of cleanliness.
- 3.1.2 The inspection also included the attic space, the accessible roof areas, and the crawlspace under the first floor bathroom/shower area of the station.

#### 3.2 Moisture Inspection

Moisture readings were taken from the drywall/plaster in various areas in the attic, in the closet under the stairwell, exercise room, bathrooms, captain's office, garage, movie room, bedrooms, and kitchen. Measurements were taken with a non-penetrating (non-destructive) and/or penetrating moisture meters.

#### 3.3 Particle Counter

- 3.3.1 Measurements of particle counts were collected from the exercise room, captain's office, kitchen, garage, outside front, locker area, shower/bathroom, and the movie room.
- 3.3.2 Measurements were analyzed by ranking particle counts from "1" greatest number of particles to "3" the third highest particle count. The indoor results were compared to other indoor locations and the outdoors.

### 3.4 VOCs

- 3.4.1 Measurements of VOCs were collected from the exercise room, captain's office, kitchen, garage, outside front, locker area, shower/bathroom, and the movie room.
- 3.4.2 Measurements were analyzed by ranking VOC concentrations from "1" greatest concentration in parts per billion (ppb) to "3" the third highest concentration in ppb. They were also compared to outdoors levels.

### 3.5 Roof Inspection

A visual inspection of the drainage scuppers, on the South side of the building was performed. This is to insure proper drainage during rain and to avoid puddling and possible roof leakage.

## 4.0 METHODS

### 4.1 Asbestos

The collection of suspect asbestos containing material (ACM) samples were performed following AHERA sampling methodology to determine if the sampled materials were either ACM (defined as any building material containing greater than one percent asbestos) or asbestos containing construction material (ACCM) defined by the State of California as any construction material containing greater than 0.1 percent asbestos.

### 4.2 Direct Reading Instrumentation

- 4.2.1 A TSI 9306V Aerotrak handheld particle counter was used to measure indoor and outdoor particle levels.
- 4.2.2 A RAE ppbRAE 3000 Photo Ionization Detector (PID) which can measure VOC levels in the parts per billion (ppb) range was used to measure indoor and outdoor VOC levels.
- 4.2.3 A Tramex handheld moisture meter that was used to measure levels of moisture in building materials. This is a non-destructive type instrument that is based on surface resistance.
- 4.2.4 Delmhorst BD-2100 moisture meter to measure the moisture content of building materials. This meter measures moisture content of materials based on the electrical resistance of the material. The unit has needle-nail like prongs, which are one half inch ( $\frac{1}{2}$ ") long and are inserted into the material to be measured.

- 4.2.5 A FLIR infrared camera was used to measure surface temperature of various surfaces in the building. Cold surface areas are represented by “blue”, which usually indicate wet areas due to the cooling effect of evaporating moisture on surfaces.

## 5.0 STANDARDS AND GUIDELINES

### 5.1 Occupational Exposures

To assess the extent of exposure, survey results are compared with regulatory standards and/or professionally recommended guidelines. For occupational exposures, reference values are published by the American Conference of Governmental Industrial Hygienists (ACGIH) and regulatory standards are set by both federal and state Occupational Safety and Health Administrations, OSHA and Cal/OSHA.

- 5.1.1 Both the regulatory standards and ACGIH guidelines are designed to protect workers from exposures to unhealthful concentrations of substances. However, the levels established by these bodies may not necessarily eliminate all effects for all people, e.g., mild irritations, response to odors, unique sensitivities, etc.

#### 5.1.2 California OSHA

Regulatory limits are described as permissible exposure limits (PELs), action levels (ALs), ceiling (C) limits, and/or short-term exposure limits (STELs).

#### 5.1.3 ACGIH

The ACGIH identifies its recommendations as threshold limit values (TLVs), ceiling (C) limits, and short-term exposure limits (STELs).

- 5.1.4 PELs, ALs, and TLVs are expressed as 8-hour TWAs for a normal eight-hour workday and a forty-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.<sup>1</sup> Ceiling limits should never be exceeded, even for brief periods. STELs generally refer to concentrations to which workers can be exposed for a short period of time without suffering from irritation, chronic, or irreversible tissue damage or narcosis of sufficient degree to increase the likelihood of accidental injury, impair self-rescue, or materially reduce work efficiency, and provided that the daily TLV-TWA is not exceeded. The STEL is not a separate, independent exposure limit; rather, it supplements the TWA where there are recognized acute effects from a substance whose toxic effects are primarily of a chronic nature.

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<sup>1</sup>2018 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, *American Conference of Governmental Industrial Hygienists*, p. 4.



## 5.2 IAQ

5.2.1 Sick building syndrome (SBS) and IAQ concerns rarely, if ever, involve exposures to substances at PEL or TLV levels. The control of SBS and IAQ concerns in non-industrial environments are generally based on perceived air quality, ventilation systems' characteristics, operational performance, and quality of system maintenance (PM).

5.2.1.1 ASHRAE Standard 62.1 - 2010, "Ventilation for Acceptable Indoor Air Quality".<sup>2</sup>

5.2.1.1.1 The purpose of this standard is to specify minimum ventilation rates and other measures intended to provide IAQ that is acceptable to human occupants and that minimize adverse health effects. The standard is intended to be used as a guide to help improve IAQ in existing buildings or a design standard in construction specifications.

5.2.1.1.2 One method to determine acceptable air quality is achieved within the space by controlling identified contaminants of concern (COC) and comparison of their concentration with IAQ references (normal or trigger/action responses); the generally perceived air quality by occupant percentage (if poor then increase fresh air flow), mass balance analysis (air dilution) to determine proper fresh minimum requirements, and/or a variation of Ventilation Rate Procedures and IAQ Procedures.

5.2.2 The following table represents many of the IAQ reference levels that are typically compared with measured contaminate levels in IAQ surveys. Typical indoor concentrations are provided along with levels above identified trigger concentrations indicating the need for further investigations.

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<sup>2</sup>American Society of Heating, Refrigerating, and Air-Conditioning Engineers, "Ventilation for Acceptable Indoor Air Quality", ASHRAE 62.1-2010, Atlanta, GA, *American Society of Heating, Refrigerating, and Air-Conditioning Engineers*, 2010.

Test	Typical Indoor Concentration	Trigger Concentration
Asbestos	<0.01 f/cc	>0.01 f/cc
Bioaerosols	Varies	2-3 Times Greater than Other Spaces or Outdoors
Carbon Dioxide	400-1000 ppm	800 ppm 700 ppm +Background
Carbon Monoxide	1-3 ppm	>5 ppm
Formaldehyde	0.01-0.05 ppm	>0.05 ppm
Moisture	Varies	40- 60 %
Nitrogen Dioxide	0.01-0.05 ppm	>0.05 ppm
Odors	None	Detectable for Extended Time
Ozone	0.01-0.02 ppm	>0.05 ppm
Particles (Dust)	<50 µg/m <sup>3</sup> (total)	>50 µg/m <sup>3</sup>
Radon	<0.5 pCi/L	>4 pCi/L
VOCs	<300 µg/m <sup>3</sup> 1-2 ppm	300 µg/m <sup>3</sup> to 3000 µg/m <sup>3</sup> Depending on Chemicals
Ref. - IAQ and HVAC Workbook, 4th Edition, Revised and Updated 2001, D.Jeff Burton, CIH, PE, CSP, ISBN 1-883992-16-8, Contaminant Concentration Checklist, p. A-27		

*Table: Indoor Air Quality Typical and Trigger Levels*

### 5.3 Asbestos

#### 5.3.1 Definitions

5.3.1.1 Asbestos Containing Material (ACM) is any material containing more than one percent asbestos (1%).

5.3.1.2 Asbestos Containing Construction Material (ACCM) is any manufactured construction material which contains more than one-tenth of one percent asbestos by weight (0.1%).

5.3.2 If the total amount of ACM or ACCM to be abated or impacted is greater than 100 square feet, the following regulations must be met.

5.3.2.1 South Coast Air Quality Management District (SCAQMD), Rule 1403. This rule requires the notification and removal of all ACM items (friable and non-friable) from a building prior to demolition. It requires the use of a state certified and registered asbestos abatement contractor and a ten (10) day written notification for asbestos disturbance activities greater than 100 square feet. However, no notification is required if there is less than 100 square feet of ACM in the building. If analytical results determine that the asbestos content in the building material is less than 1% then this rule does not apply.

5.3.2.2 Labor Code 6501.5 requires the use of a state certified and registered asbestos abatement contractor for all asbestos removal project of more than 100 square fee of either ACM or ACCM.

- 5.3.2.3 Federal Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1101, California CCR Title 8 §1529 and 5208 require employers to monitor the exposure of their employees who may be exposed to asbestos. If employees are exposed above certain criteria; i.e., the PEL, the employer must take action to limit the employee's exposure to asbestos and to protect the employee's health.

## 6.0 SURVEY RESULTS, DISCUSSION, AND RECOMMENDATIONS

- 6.1 The sampling results tables relating to this survey are listed below.

- 6.1.1 Table I - Results for Visual Inspection.

- 6.1.2 Table II - Results for Moisture.

- 6.1.3 Table III - Air Sampling Results for Particle Counter.

- 6.1.4 Table IV - Air Sampling Results for Volatile Organic Compounds.

- 6.1.5 Table V - Bulk Sampling Results for Asbestos.

- 6.2 Appendices

- 6.2.1 Laboratory report for asbestos is provided in APPENDIX I - Laboratory Report.

- 6.2.2 Instrument calibration certifications are provided APPENDIX II - Instrument Calibration Certifications.

- 6.2.3 Photographs of the project are provided in APPENDIX III - Photographs.

- 6.3 Findings

- 6.3.1 The general cleanliness of the Fire Station was not impressive. When inspecting the horizontal surfaces "white glove tests" on the following areas stood out as having more dirt/grime than others. They were the exercise room on top of the vending machine and sills; the main hallway picture frames; the Captains Office; and second floor bedrooms #1 and #3. More surface cleaning is recommended in these areas. See photographs which depict these conditions.

- 6.3.2 There were two areas that were measured which showed visible water leakage (as it was raining during the inspection). The first floor sleeping quarters in bedroom #3 and the second floor sleeping quarters in bedroom #1.

These were serious leaks where water was actually observed dripping inside. These windows should be inspected and repaired. Also, the firemen raised concern of the blistering wall paint in the second floor bedroom #3 (historic in nature). Moisture measurements were dry; however, blistering paint areas around windows should be repaired as this is not normally acceptable living conditions (See photographs).

- 6.3.3 Particle count levels indoors were elevated as compared to outdoors. The first floor bathroom and shower room were elevated for larger particles. The most likely cause was shower use just prior to our inspection (i.e. suspended moisture droplets). Overall particle levels were down compared to the previous quarterly inspection (180397LA, October 11, 2018).
  - 6.3.4 VOCs levels were within normal range. Overall VOC levels were also down compared to the previous quarterly inspection. One note however was that the emissions exhaust connect-up in the garage was observed disconnected from a fire truck. The exhaust connects should be used in order to reduce VOCs, carbon monoxide, and particulate contamination of the occupied spaces.
  - 6.3.5 Inspection of the crawl space revealed that the south wall footing was leaking rain water. Also, as a result, the soil was moist in areas (See photographs). These conditions can promote mold growth and should be repaired. Photographs show puddling outside the south wall. Better drainage from rain water is recommended.
  - 6.3.6 It was suggested to remove and replace the bottom shelf of the first floor bathroom supply cabinet. The wood is deteriorated and was one of the locations showing false positives for elevated levels of moisture. This was not done and is still suggested to be removed and replaced.
  - 6.3.7 The roof drains on the second floor balcony still need to be cleaned of leaves and other trash. This could cause future water leaks indoors and lead to subsequent mold growth (See photographs).
  - 6.3.8 The attic insulation was questioned whether or not it contained asbestos. Samples were collected and results show that there was no asbestos detected in the sampled materials (i.e. ND). Inspection of the attic space will resume during the next inspection.
  - 6.3.9 In general, the station needs cleaning and repairs as noted.
- 6.4 This report was prepared for use by City of Long Beach in evaluating the subject location. The information contained within this report is as factual as possible and the opinions related herein are based on HSA's experience in similar investigations.

No warranty, therefore, is made to any persons other than City of Long Beach regarding the conclusions or recommendations included within this report. HSA will not release copies to a third party without prior written consent of City of Long Beach.



Table I - Air Sampling Results for Visual Inspection

City of Long Beach Fire Station #9  
3917 Long Beach Boulevard  
Long Beach, California 90807  
January 14, 2019

Description	Evaluation	Comment
General Areas	Un -Satisfactory	Needs cleaning (Hallway).
Exercise Room	Un -Satisfactory	Horizontal Surfaces Dusty/Grimy (white glove tests)
Captain's Office	Un -Satisfactory	Horizontal Surfaces Dusty/Grimy (white glove tests)
1st Floor Bathroom Shower Room	Satisfactory	
Garage	Satisfactory	Disconnected emission exhaust from truck
2nd Floor TV & Bedrooms	Un -Satisfactory	Horizontal Surfaces Dusty/Grimy (white glove tests). Windows need repair in Room #1 and #3.
Kitchen	Satisfactory	

Table II - Results for Moisture

City of Long Beach Fire Station #9  
3917 Long Beach Boulevard  
Long Beach, California 90807  
January 14, 2019

Description	Evaluation	Comment
General Areas	Satisfactory	
Crawlspace	Un-Satisfactory	South wall footing leaking rain water. Soil appears moist form water. Puddling observed outside south wall from rain. Repair drainage of rain water.
Attic Space	N/A	Resume inspection of area during next inspection. No asbestos in insulation material.
Under Stairwell Closet	Satisfactory	Framing wood during construction of building was covered with cement/plaster and appears dirty. Otherwise Dry
Exercise Room	Satisfactory	
1st Floor Bathroom Shower Room	Satisfactory	
Captain's Office	Satisfactory	
Garage	Satisfactory	
1st Floor Hallway and areas proximal to Sleeping Rooms.	Satisfactory	
2nd Floor TV & Bedrooms	Un-Satisfactory	Room #1 window leaking rain water. Room #3 repairs around window (Staining/Blistering but Dry).
Kitchen	Satisfactory	
Roof Drains (South Side)	Un-Satisfactory	Papers/debris present. Cleaning needed.
1 <sup>st</sup> Floor Bedrooms	Un-Satisfactory	Room #3 window leaking rain water.
<b>Instrumentation:</b> Tramex Moisture Encounter Plus		

Table III - Air Sampling Results for Particle Counter

City of Long Beach Fire Station #9  
3917 Long Beach Boulevard  
Long Beach, California 90807  
January 14, 2019

Particle Size Distribution	Exercise Room	Captains Office	Kitchen	Garage	Outside Front	Locker Area	Shower/Bathroom	TV Room	Rank Order (1, 2, and 3)
0.3 µm	90082	74248	66624	55739	89492	67752	114764	61418	1 Shower 2 Exer 3 Outside
0.5 µm	15760	13336	13009	8437	10204	13762	19873	12017	1 Shower 2 Exer 3 Locker
1.0 µm	3842	9887	408	1880	1896	3910	4701	3441	1 Cap 2 Shower 3 Locker
3.0 µm	841	991	929	218	264	981	963	685	1 Cap 2 Locker 3 Shower
5.0 µm	354	373	366	51	50	462	374	254	1 Locker 2 Shower 3 Cap
10 µm	75	54	78	6	9	458	76	44	1 Locker 2 Kit 3 Shower
<b>Abbreviation:</b> µm=micro meters									

Table IV - Air Sampling Results for Volatile Organic Compounds

City of Long Beach Fire Station #9  
3917 Long Beach Boulevard  
Long Beach, California 90807  
January 14, 2019

Description	Exercise Room	Captains Office	Kitchen	Garage	Outside Front	Locker Area	Shower/Bathroom	TV Room	Rank Order (1, 2, and 3)
VOCs (ppb)	0	0	0	14	49	21.5	4	67	1 TV Rm 2 Outside F 3 Locker
<b>Abbreviation:</b> ppb=parts per billion; Normal Levels = 1-2 ppm (1000-2000 ppb)									

Table V - Bulk Sampling Results for Asbestos

City of Long Beach Fire Station #9  
3917 Long Beach Boulevard  
Long Beach, California 90807  
January 14, 2019

**HSA Project No.:** 190101LA

**Project:** City of Long Beach, Fire Station 9, 3917 Long Beach Boulevard, Long Beach, CA

**Date:** January 14, 2019

**Ind. Hyg.:** H. Ozar/R. Medina

Sample No.	Material	Location	Description	Asbestos Results Type and Percent (%)	Condition	Approximate Square/Linear footage
19011417	Blown in attic Insulation	Attic	South Side	ND	--	--
19011418			West Side	ND		
19011419			North Site	ND		
Standards/Guidelines:						
EPA - ACM						>1.0
State of California - ACCM						>0.1
Analytical Method: EPA 600/R-93/116 - Polarized Light Microscopy (PLM)						
Abbreviations: ND = none detected; < = less than; % - percent; EPA = Environmental Protection Agency; ACM = Asbestos Containing Material; ACCM = Asbestos Containing Construction Material; LF = linear feet; ft² = square feet; bold/shade = ACM; bold print only = ACCM						
Disclaimer: HSA's measurements and component identifications are approximations and <b>must be confirmed</b> by contractors bidding the project. In addition, hidden or unknown suspect asbestos containing materials (ACM)/asbestos containing construction materials (ACCM) or lead containing/coated materials may be uncovered during the project. Multiple layers of building materials exist, abatement includes all layers of both ACMs and non-ACMs including all residue. Similar materials in color, texture and appearance as those identified in HSA's report should be considered asbestos until sampled. All contractors working on the project should notify the Owner regarding the discovery of unidentified hazardous materials. All work to be performed in accordance with all state, local and federal regulations.						



## **APPENDIX I - Laboratory Report**



# LA Testing

5431 Industrial Drive Huntington Beach, CA 92649

Tel/Fax: (714) 828-4999 / (714) 828-4944

<http://www.LATesting.com> / [gardengrovelab@lateesting.com](mailto:gardengrovelab@lateesting.com)

LA Testing Order: 331900715

Customer ID: 32HEAL56

Customer PO:

Project ID:

**Attention:** Joel Berman  
Health Science Associates  
10771 Noel Street  
Los Alamitos, CA 90720

**Phone:** (714) 220-3922

**Fax:**

**Received Date:** 01/14/2019 1:48 PM

**Analysis Date:** 01/16/2019

**Collected Date:** 01/14/2019

**Project:** 190101LA / City of Long Beach, Fire Station #9

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
19011417	Attic South Side	White Fibrous Homogeneous	98% Glass	2% Non-fibrous (Other)	None Detected
331900715-0001					
19011418	Attic West Side	White Fibrous Homogeneous	98% Glass	2% Non-fibrous (Other)	None Detected
331900715-0002					
19011419	Attic North Side	White Fibrous Homogeneous	98% Glass	2% Non-fibrous (Other)	None Detected
331900715-0003					

Analyst(s)

Sotheary Son (3)

Michael DeCavallas, Laboratory Manager  
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method"), but augmented with procedures outlined in the 1993 ("final") version of the method. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. All samples received in acceptable condition unless otherwise noted. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. EMSL recommends gravimetric reduction for all non-friable organically bound materials prior to analysis. Estimation of uncertainty is available on request.

Samples analyzed by LA Testing Huntington Beach, CA NVLAP Lab Code 101384-0, CA ELAP 1406

Initial report from: 01/16/2019 13:13:07

TAT =  
72 hours  
11/14/19 1348

10770 Noel Street • Los Alamitos, CA 90720

Office: (714) 220-3922 • Fax: (714) 220-2081

Page 3 of 3

Bulk

#331900715

FOUR-GAS DIRECT READ INSTRUMENT SAMPLING DATA SHEET

Project Manager: Joel Berman		Project #: 190101LA		Date: 1/14/2019	
Client: City of Long Beach, Fire Station #9		Industrial Hygienist: Howard Ozar		Rene Medina	
Project Location: 3917 Long Beach Blvd. Long Beach, CA		Calibration Gas Used	VOCs: ppm	(Enter gas name)	
			ppm	% VOL	
			%	(Enter gas name)	
		Gas Expiration:			
<input type="checkbox"/> OSHA Compliance		<input checked="" type="checkbox"/> Routine Inspection		<input type="checkbox"/> Background	

Sample #	Instrument Make/Model	Serial Number / Calibration Date	Monitored Gas(es)	Start Time	Stop Time	Total Time	Location/Description/Remarks
19011417	Bulk	AsbestDS PLM Method	<input type="checkbox"/> VOCs				Attic <del>1/14/19 East side RM</del> South side
19011418			<input type="checkbox"/> VOCs				Attic West side
19011419			<input type="checkbox"/> VOCs				Attic North side
			<input type="checkbox"/> VOCs				
			<input type="checkbox"/> VOCs				
			<input type="checkbox"/> VOCs				
			<input type="checkbox"/> VOCs				
			<input type="checkbox"/> VOCs				
			<input type="checkbox"/> VOCs				

Relinquish: Howard Ozar 1/14/19 1348

Received: W 1-14-19 1348

## **APPENDIX II - Instrument Calibration Certifications**



# Calibration Certificate

rev 8/9/11

Work Order No.: SE-063835

Date of Service: 1/11/2019

Unit Under Test: RAE ppbRAE 3000 PID

Asset No.: FA03747

Technician: Christine Tong

Initials: CYT

Serial No:

TEST	Specification	Result
Standard Calibration	Pass/Fail	PASS

TEST STANDARDS USED:

DESCRIPTION	LOT NO./EXPIRATION DATE	QUANTITY
10ppm Isobutylene in Air	Lot No. TFBI-248-10-7 Exp. 05/15/2022	1

TEST EQUIPMENT USED:

DESCRIPTION	ASSET NO.	SERIAL NO.	DATE OF LAST CAL	DATE CAL DUE

Test Equipment and standards are traceable to National standards.



# CERTIFICATE OF CALIBRATION

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
 TCI: 1-800-874-2811-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

ENVIRONMENT CONDITION			MODEL	9306-V2
TEMPERATURE	75.9 (24.4)	°F (°C)	SERIAL NUMBER	93061140005
RELATIVE HUMIDITY	24	0/0RH		
BAROMETRIC PRESSURE	28.86 (977.3)	inHg (hPa)	CUSTOMER INST ID	
As LEFT			IN TOLERANCE	
As FOUND			C] OUT OF TOLERANCE	
AEROTRAK CALIBRATION KIT				
MEASUREMENT VARIABLE	SYSTEM ID	DATE LAST CALIBRATED	CALIBRATION DUE DATE	
7201-02F	E003889	09-21-2017	03-31-2018	
FLOW METER	E005518	01-04-2018	07-31-2018	
RELAT FLOW METER	E005634	08-29-2017	02-28-2018	

PARTICLE STANDARDS				
PARTICLE SIZE	STANDARD UNCERTAINTY	STANDARD DEVIATION	LOT No.	EXPIRATION DATE
0.30	0.003	0.0047 pm	174664	10/31/2019
0.506 um	0.004 pm	0.0085	168223	4/30/2019
0.994	0.0075	0.0100 gm	171667	6/30/2018
2.920 pm	0.015 pm	0.03	181443	02/28/2020
5.020 gm	0.015 vim	0.0611m	179268	01/31/2020
9.85 gm	0.04 pm	0.13 pm	172685	8/31/2019

TSI does hereby certify that the calibration performed on the above described instrument meets the requirements of ISO 21501-4. TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to the United States National Institute of Standards and Technology (NIST) or has been verified with respect to instrumentation whose accuracy is traceable to NIST, or is derived from accepted values of physical constants. TSI is registered to ISO-9001:2015.

CALIBRATED

January 23, 2018

DATE

9.85 gm  
 TSI does  
 21501-4  
 (not app)  
 States 4  
 accurate

Model 9306-V2 SN93061140005 Tuesday,

2018

AM

whose  
 2015.

Page 1 of 2

# CERTIFICATE OF CALIBRATION

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
Tel: 1-800-874-2811-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

## SIZE CALIBRATION AND VERIFICATION OF SIZE SETTING

NOMINAL PARTICLE SIZE	GAIN STAGE	DIGITAL CUTPOINT	
03 $\mu$ m		22	
0.5 $\mu$ m		270	
1 $\mu$ m			
		50	
5 $\mu$ m		155	
10		540	

COUNTING EFFICIENCY				SIZE RESOLUTION			
PARTICLE SIZE	ACTUAL	ALLOWABLE RANGE	PASS/FAIL	PARTICLE SIZE	MEASURED	ALLOWABLE RANGE	PASS/FAIL
	50%	$\pm 20\%$	Pass	0.5 $\mu$ m	6.6%	S15%	Pass
0.5 $\mu$ m	95%	100% $\pm$	Pass				

## FALSE COUNT RATE

SAMPLE TIME (MIN)	SAMPLED (L)	MEASURED COUNTS	CONCENTRATION (#/M3)	95% UCL (#/M3)	ALLOWABLE RANGE (#)
30	87		0.00	345	

SAMPLING FLOW RATE (L/MIN)					SAMPLING	
NOMINAL	ACTUAL	ERROR	ALLOWABLE RANGE	PASS/FAIL	MEASURED	ALLOWABLE RANGE
2.83	2.90	2.5 %		Pass		10/0

RESPONSE RATE T		
SAMPLE MEASURED	ALLOWABLE RANGE	PASS/FAIL
0.08%	S 0.5%	Pass

MAXIMUM PARTICLE CONCENTRATION †	
210000000	@10% Coincidence Loss

† Tested and verified during product development

CALIBRATION INTERVAL	
CALIBRATION DATE	EXPIRATION DATE
January 23, 2018	January 23, 2019

Model 9306-V2 SN 93061140005 Tuesday, January 23, 2018

AM

Page 2 of 2

# CERTIFICATE OF CALIBRATION

Tel.° 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

TSI In

ENVIRONMENT CONDITION			MODEL	9306-V2
TEMPERATURE	75.9 (24.4)		SERIAL NUMBER	93061140005
RELATIVE HUMIDITY	24	O/ORH		
BAROMETRIC PRESSURE	28.86 (977.3)	inHg (hP@)	CUSTOMER INST ID	
As LEFT @ IN TOLERANCE				
E As FOUND OUT OF TOLERANCE				
AEROTRAK CALIBRATION KIT				
MEASUREMENT VARIABLE	SYSTEM II)	DATE LAST CALIBRATED	CALIBRATION DUE DATE	
7201-02F	E003889	09-21-2017	03-31-2018 V2	
FLOW METER	E005518	01-04-2018	07-31-2018	
FLOW METER	E005634	08-29-2017	02-28-2018	

PARTICLE STANDARDS				
PARTICLE SIZE	STANDARD UNCERTAINTY	STANDARD DEVIATION	LOT NO.	EXPIRATION DATE
0.303 um	0.003 pm	0.0047 pm	174664	10/31/2019
0.508	0.004 gm	0.0085 pm	168223	4/30/2019
0.994 gm	0.0075 um	Os010gm	171667	6/30/2018
2.920 gm	0.015 um	0.03	181443	02/28/2020
5.020 pm	0.015 pm	0.06 pm	179268	01/31/2020
9.85 pm	0.04 pm	0.13 gm	172685	8/31/2019

TSI does hereby certify that the calibration performed on the above described instrument meets the requirements of ISO 21501-4. TSI does hereby certify that it States National Institute of Standards and Technology (NIST) or has been verified with respect to instrumentation whose accuracy is traceable to NIST, or is derived

VERIFIED

January 23, 2018

DATE

# CERTIFICATE OF CALIBRATION

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA

Tel; 1-800-874-2811 1-651-490-2811 Fax; 1-651-490-3824 <http://www.tsi.com>

## SIZE CALIBRATION AND VERIFICATION OF SIZE SETTING

NOMINAL PARTICLE SIZE	GAIN STAGE	PREVIOUS DIGITAL CUTPOINT	As FOUND DIGITAL CUTPOINT	MEASURED PARTICLE SIZE	SIZE ERROR	ALLOWABLE RANGE	PASS/F
0.3 gm			19	0.30 gm	0.0%		
0.5 gm		270	270	0.49 gm	-2.2%	100/0	
				1.00 gm	0.0%		
3 gm		64	50	2.81 gm	-6.4%		
		155	155	5.00 gm	0.0%		
10 gm		600	540	9.79 gm	-2.1%		

COUNTING EFFICIENCY			
PARTICLE SIZE	ACTUAL	ALLOWABLE RANGE	PASS/FAIL
0.3 gm		± 20%	Pass
0.5 gm	96%	100% ±	Pass

SIZE RESOLUTION			
PARTICLE SIZE	MEASURED	ALLOWABLE RANGE	PASS/FAIL
0.5 gm	6.9%		Pass

## FALSE COUNT RATE

SAMPLE TIME (MIN)	SAMPLED	MEASURED COUNTS	CONCENTRATION	95% UCL (#/M3)	ALLOWABLE RANGE

RESPONSE RATE t		
MEASURED	ALLOWABLE RANGE	PASS/FAIL
0.08%	s 0.5%	Pass

NLXXIMUM PARTICLE CONCENTRATION	
210000000 #/m <sup>3</sup>	Coincidence Loss

Tested and verified during product development

## **APPENDIX III - Photographs**





**AERO TRAK™**

**PARTICLE COUNTER**

**Recipes**

1/14/2019

09:04:37

Default

Recipe: "Default"  
Count Mode: Automatic  
Count Units:  $\Sigma$  #  
Start Delay: 00:00:05  
Sample Time: 00:01:00  
Hold Time: 00:00:00  
Cycles: 1  
Assigned to 0 Zone(s)  
Channels Size(ALRM):  
0.3(None) 0.5(None)  
1.0(None) 3.0(None)  
5.0(None) 10.0(None)

1/100 Recipes

Delete

Add

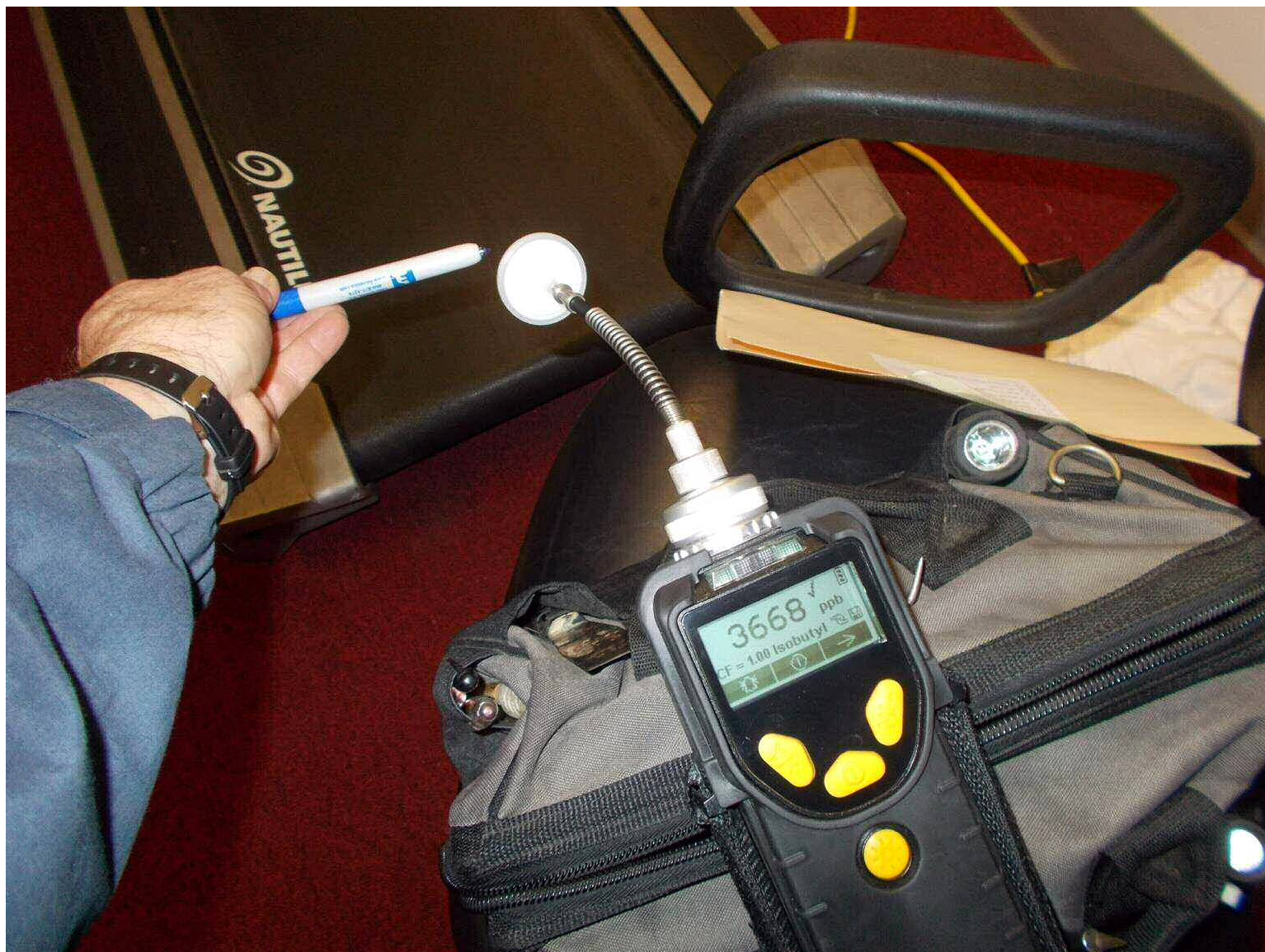
Edit

Close





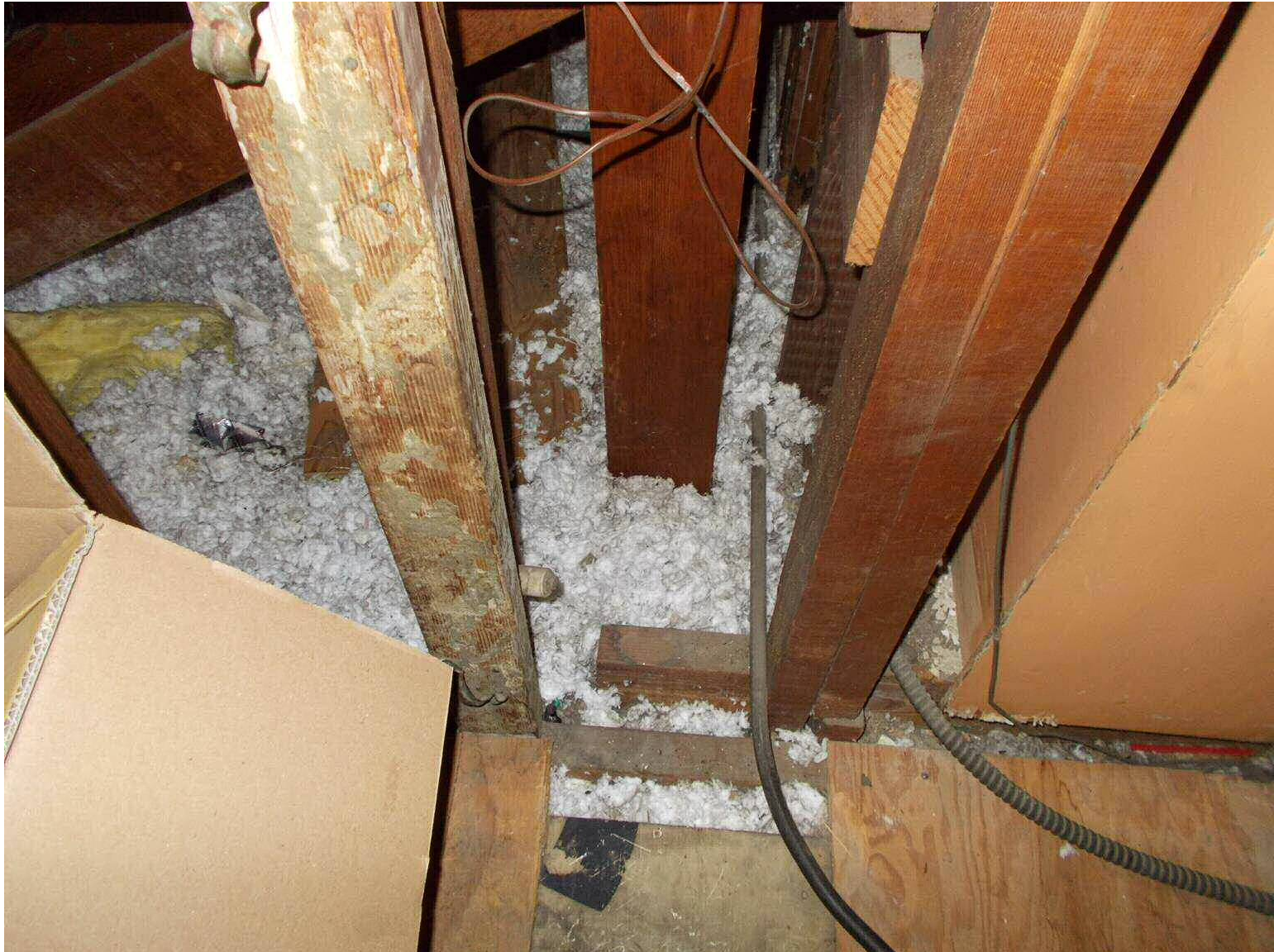








































3

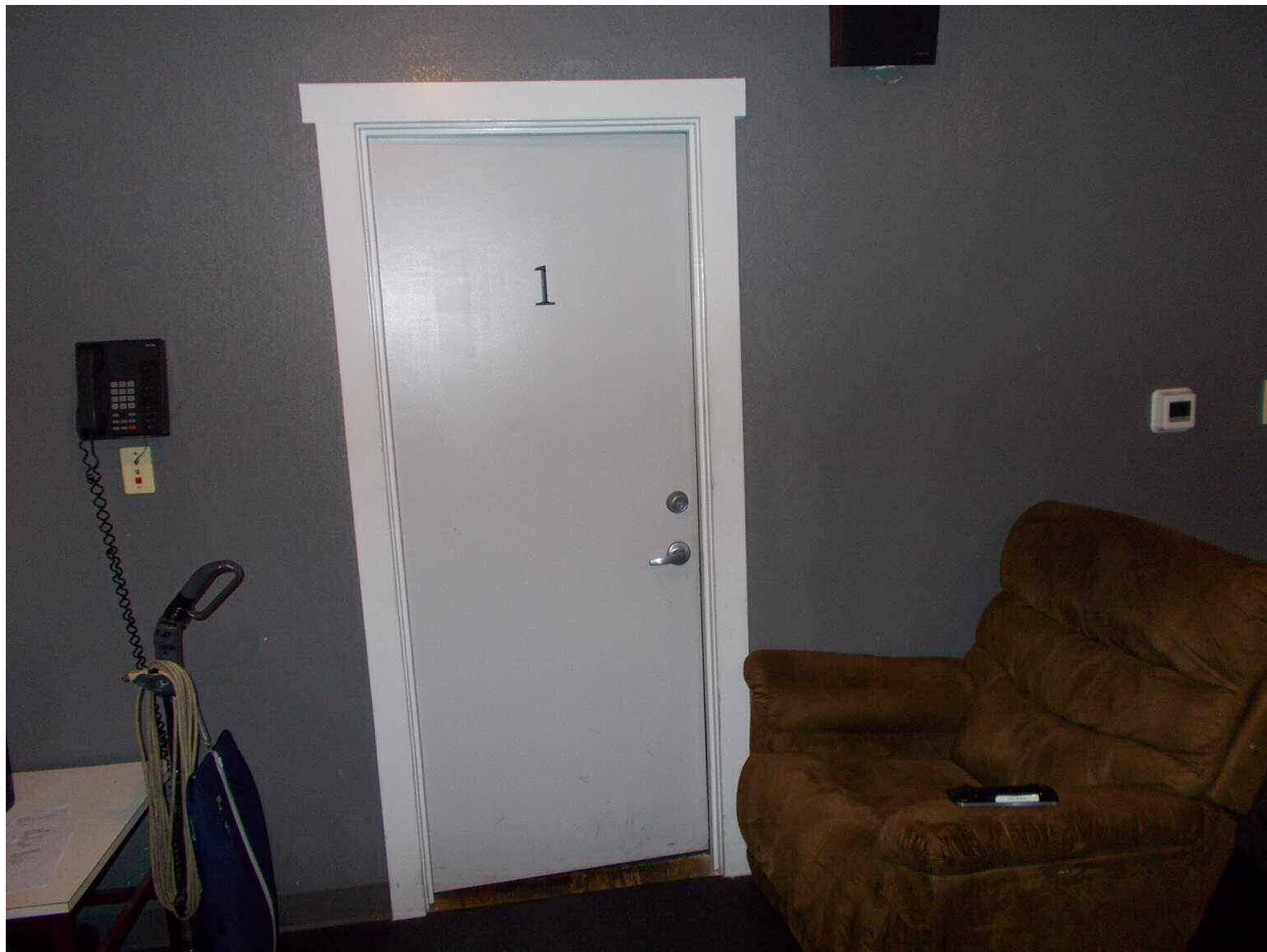




















A photograph of a wooden surface, possibly a table or desk. In the center, there is a white, oval-shaped object, likely a piece of paper or a small container. Above this object, the number "57.8" is displayed in white, with a small plus sign (+) directly beneath it. The background is a warm, reddish-brown wood grain.

57.8  
+





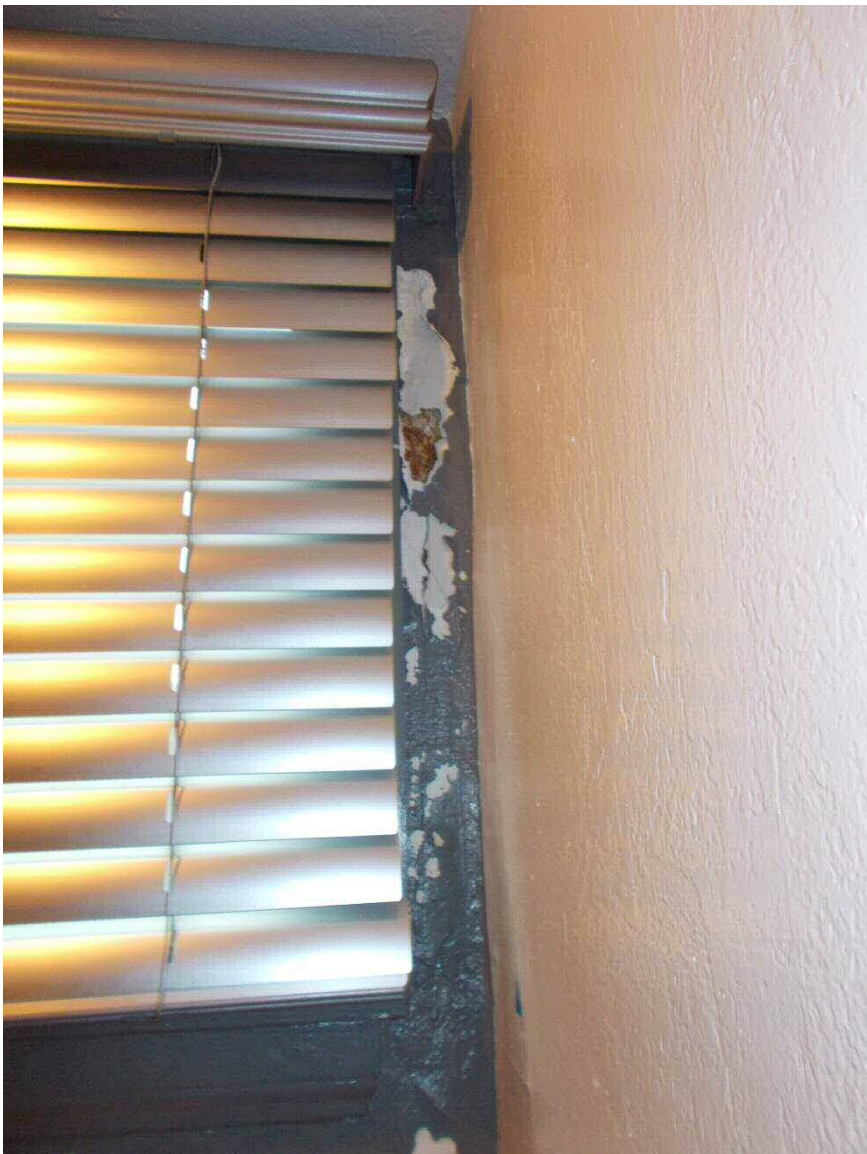




















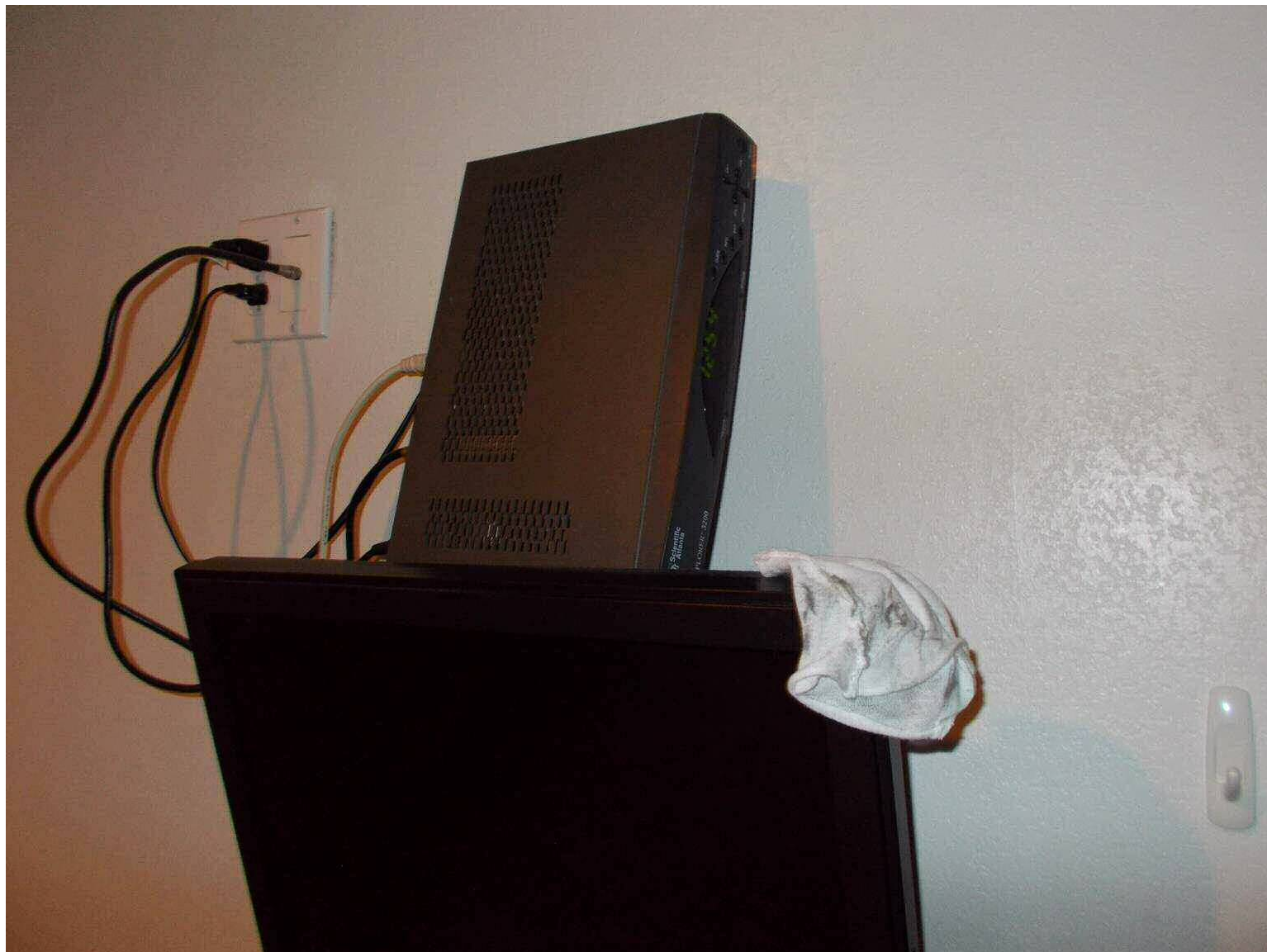






















*Quarterly Industrial Hygiene Inspection (6/4/2019)*



## Quarterly Industrial Hygiene Inspection

Performed at

City of Long Beach  
Fire Station #9  
3917 Long Beach Blvd.  
Long Beach, California 90807

Performed on April 22-23, 2019

Submitted To

Kevin Burke  
City Safety Specialist Books I  
City of Long Beach  
333 W. Ocean Blvd., 10th Fl  
Long Beach, California 90802

HSA Project Number 190235LA

Report Date

June 4, 2019

Prepared By,



Howard J. Ozar, CIH  
Industrial Hygienist

Reviewed By,



Joel I. Berman, CIH, CSP, CAC, CIAQM  
Vice President



## EXECUTIVE SUMMARY

On April 22 and 23, 2019, Health Science Associates (HSA), performed a Quarterly Industrial Hygiene Inspection at the City of Long Beach Fire Station #9 located at, 3917 Long Beach Boulevard, in Long Beach, California.

The original purpose of the quarterly inspections were to perform an evaluation of the following items.

- Perform a visual inspection of the station to document general cleanliness of the surfaces in the building.
- Perform an inspection of the attic space, the accessible roof areas, and the crawlspace under the first floor, bathroom/shower area of the station.
- Perform a moisture intrusion evaluation of the Fire Station using primarily a non-penetrating moisture meter and an infrared camera. The intention is to detect water leaks as early as possible.
- Use a particle counter to determine the concentration of airborne dust in the Fire Station, as compared to the outdoor environment.
- Utilize a photo ionization detector (PID) with sensitivity to detect volatile organic compounds (VOCs) in parts per billion (ppb) range, to determine whether there is any measurable levels above background/outside.

Pursuant to the request of the city, during this quarterly inspection, the following items were added to the scope of work.

- Collect full shift temperature, relative humidity, carbon dioxide (CO<sub>2</sub>), and carbon monoxide (CO) direct reading measurements in the two locations on the second floor, three locations on the first floor, and one outdoor location.
- Perform a fungal evaluation of the windows that were determined to be leaking during our January 14, 2019 site visit. This inspection is to include minimal destructive testing (i.e. the removal of the baseboard). If suspect fungal growth is discovered during window replacement, then further testing would be warranted.
- Inspect the mattress in the various bedrooms to determine whether they are stained and/or have evidence of the presence of suspect materials. If suspect analysis items, specifically, "Bed Bugs" (i.e. *Cimex lectularius*) are determined to be



## EXECUTIVE SUMMARY (CONT'D)

present, collect settle dust samples to be analyzed via Polymerase Chain Reaction (PCR) analysis. We are including no more than three dust samples.

- Inspect the various heating, ventilation, and air conditioning (HVAC) system/units of the fire station, including window units and their filters. Access to the HVAC systems/units is to be provided by a city representative or a city contractor. HSA will not open the units.

The background related to this Fire Station is that previously, there have been various indoor air quality (IAQ) and water intrusion issues for an extended period of time. It was determined that there was fungal growth in the building and that the interior of the building had a heavy layer of built-up dust on various surfaces (see HSA Reports 180034LA, 180081LA, and 180117LA.). The areas where fungal growth was determined are listed in the following table.

Attic Kitchen, suspect visible mold
Kitchen, suspect mold on ceiling
Kitchen, suspect mold on ceiling
Exercise room from possible visible mold at northeast side
Dorm Room 3, second floor

After the fungal remediation, HSA performed post fungal total spore air and surface remediation sampling, to confirm that the remediation was successful (HSA Report 180117LA).

After the post fungal remediation sampling determined that the containments could be removed, a complete and thorough cleaning of the Fire Station was performed, in order to clean the years of settled dust on various surfaces. HSA also recommended that a thorough cleaning be instituted in the Fire Station in order to prevent significant dust build-up from recurring.

A visual inspection was performed in the Fire Station after the thorough cleaning was completed (HSA Report 180117LA).

The general cleanliness of the fire station was improved. When inspecting horizontal surfaces “white glove tests” the following areas stood out as having more dirt/grime than others. They were the locker room and the 2<sup>nd</sup> Floor Bed Room. See photographs DSCN3712, DSCN3713, and DSCN3714 which depict these conditions.

The IAQ parameter measurements determined the results were not remarkable as compared to guidelines or the ambient outdoor concentrations.

## EXECUTIVE SUMMARY (CONT'D)

Particle count levels were higher outdoors than indoors for midrange particles ranging from 0.5  $\mu\text{m}$  to 3  $\mu\text{m}$ . The shower/bathroom on the first floor and kitchen were higher than outdoors for small, 0.3  $\mu\text{m}$  and large 5  $\mu\text{m}$  to 10  $\mu\text{m}$  particle range. Overall total counts were 1.7 times higher this quarter than last quarter's data.

The HVAC system inspection showed that the return air filters were loaded with dust and were being changed (not neglected) as the most recent change date was 3/22/19 (about a month prior to this survey date). See photographs DSCN3775 - DSCN3783.

Inspection of the HVAC unit in the attic showed that the cooling coil and condensate pan were clean (new in fact). However, the fresh air intake was not connected. According to the HVAC technician working with HSA, the system is scheduled for upgrade with UV lights, etc. HSA assumes fresh air will be connected in at that time or has been planned for at that time.

There were two areas inspected for mold and moisture where the baseboard and carpeting was moved back for detailed inspection. These areas included the 1<sup>st</sup> Floor Bed Room #2 and 2<sup>nd</sup> Floor Bed Room #1. Both areas were dry and no mold was found. No observable work has been done to these windows to correct water leakage. See photographs DSCN3785 to DSCN3808 for the 1<sup>st</sup> Floor Bedroom Window and DSCN3809 to DSCN3832.

Total VOCs were 8.5 times higher this quarter than last quarter's data. The indoor levels were 5 times higher than outdoors (background). They were still within IAQ Normal Limits. Another possible reason for higher VOC levels is lack of a fresh air intake for the HVAC unit.

Inspection of the crawlspace was similar as the prior inspection. Samples were collected of areas pointed out as being of a concern. The sampling results of these locations were negative for fungal. See Table V - Results for Total Surface Fungal Spores. No observable work was done to repair drainage of leaks from rains were observed.

The roof drains on the second floor balcony still need to be cleaned of leaves and other trash.

No evidence of the presence of Bed Bugs were determined by laboratory analysis of dust and debris collected using a vacuum and sample collection device. Analysis was via PCR (DNA).

Inspection of the laundry room showed water was present under the rug. The water leak HSA believed was from a washing machine. This finding was immediately mentioned to HSA's contact for prompt action to prevent possible mold growth.

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## 1.0 INTRODUCTION

### 1.1 General Introduction

- 1.1.1 On April 22-23, 2019, Health Science Associates (HSA) performed a Quarterly Industrial Hygiene Inspection at City of Long Beach Fire Station #9 located at 3917 Long Beach Blvd., Long Beach, California.
- 1.1.2 Project inspection and report preparation were performed by Howard J. Ozar, Certified Industrial Hygienist (CIH), assisted by Rene Medina, Industrial Hygiene Technician.
- 1.1.3 Project set-up, management, overview, and report review were performed by Joel I. Berman, CIH, CSP, Certified Asbestos Consultant (CAC), Certified Indoor Air Quality Manager CIAQM, Vice President.

### 1.2 Purpose

- 1.2.1 Perform a visual inspection of the station to document general cleanliness of the surfaces in the building.
- 1.2.2 Perform an inspection of the attic space, the accessible roof areas, and the crawlspace under the first floor bathroom/shower area of the station.
- 1.2.3 Perform a moisture intrusion evaluation of the fire station using primarily a non-penetrating moisture meter and an infrared camera. The intention was to detect water leaks as early as possible.
- 1.2.4 Use a particle counter to determine the concentration of airborne dust in the station as compared to the outdoor environment.
- 1.2.5 Utilize a photo ionization detector (PID) with sensitivity to detect volatile organic compounds (VOCs) in parts per billion (ppb) range to determine whether there is any measurable levels above background/outside.
- 1.2.6 Collect full shift temperature, relative humidity, carbon dioxide (CO<sub>2</sub>), and carbon monoxide (CO) direct reading measurements in two locations on the second floor, three locations on the first floor, and one outdoor location.
- 1.2.7 Perform a fungal evaluation of the windows that were determined to be leaking during our most recent quarterly inspection of January 14, 2019.

This inspection is to include minimal destructive testing (i.e. the removal of the baseboard).

- 1.2.8 Inspect the mattresses in the various bedrooms to determine whether they were stained and/or have evidence of the presence of suspect materials. If suspect analysis items, specifically, "Bed Bugs" (i.e. *Cimex lecturlarius*) were suspected to be present, collect settled dust samples to be analyzed via Polymerase Chain Reaction (PCR) analysis.
- 1.2.9 Inspect the various heating, ventilation, and air conditioning (HVAC) system/units of the fire station, including window units and their filters.
- 1.3 The monitoring results were also evaluated and compared with background levels, Indoor Air Quality (IAQ) standards by the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE), other guidelines and published references.

## 2.0 BACKGROUND

- 2.1 The background related to this fire station is that previously, there have been various IAQ and water intrusion issues in the fire station for an extended period of time. It was determined that there was fungal growth in the building and that the interior of the building had a heavy layer of built-up dust on various surfaces (see HSA project number reports 180034LA, 180081LA, and 180117LA).
- 2.2 After the fungal remediation. HSA performed post fungal total spore air and surface remediation sampling to confirm that the remediation was successful (HSA report 180117LA). The areas where fungal growth was determined/were remediated are listed in the following table.

Attic Kitchen, suspect visible mold
Kitchen, suspect mold on ceiling
Kitchen, suspect mold on ceiling
Exercise room from possible visible mold at northeast side
Dorm Room 3, second floor

- 2.3 After the post fungal remediation sampling determined that the containment could be removed, then a complete and thorough cleaning of the fire station was performed to clean the years of settled dust on various surfaces. HSA also



recommended that thorough cleaning be instituted in the fire station to prevent significant dust build-up from recurring.

- 2.4 A visual inspection was performed in the fire station after the thorough cleaning was completed (HSA Report 180117LA).
- 2.5 HSA was requested to perform quarterly inspections of the fire station to evaluate its condition. This is the sixth Quarterly Industrial Hygiene Inspection to continue and maintain clean conditions in the fire station since the last thorough cleaning.
- 2.6 In addition to the above, a video of the crawlspace of the fire station was provided and reviewed in relationship to the perception of an indoor air quality (IAQ) issue in this building.
  - 2.6.1 The video was shot exclusively within the crawlspace and appeared to concentration on white material that was proximal to the cement footings and wooden supports. The assumed intention of the video was to indicate that the white material was fungal growth (representative total spore surface samples were collected of this material and the results are reported on Table V). However, these items appeared actually to be mineral deposits in the crawlspace, which are the result of water issues in the area. There was no actual visible suspect fungal growth in the area.
  - 2.6.2 The video also appeared to intend that the crawlspace was in dis-repair and was in need of attention. The building is approximately 80 to 90 years old, and the presence of mineral deposits, some water staining, and other visible evidence of age is not unanticipated.

### 3.0 ASSESSMENT

#### 3.1 Visual Inspection

- 3.1.1 A visual inspection of the station was conducted to document general cleanliness of surfaces. This was done by direct observation and by "white glove testing" to determine the extent of cleanliness.
- 3.1.2 The inspection also included the attic space (above kitchen), the accessible roof areas, and the crawlspace under the first floor bathroom/shower area of the station.

### 3.2 Moisture Inspection

Moisture readings were taken from the drywall/plaster in various areas in the attic, in the closet under the stairwell, exercise room, bathrooms, captain's office, garage, movie room, bedrooms, and kitchen. Measurements were taken with a non-penetrating (non-destructive) and/or penetrating moisture meters.

### 3.3 Particle Counter

3.3.1 Measurements of particle counts were collected from the exercise room, captain's office, kitchen, garage, outside front, locker area, shower/bathroom, and the movie room.

3.3.2 Measurements were analyzed by ranking particle counts from "1" greatest number of particles to "3" the third highest particle count. The indoor results were compared to other indoor locations and the outdoors.

### 3.4 VOCs

3.4.1 Measurements of VOCs were collected from the exercise room, captain's office, kitchen, garage, outside front, locker area, shower/bathroom, and the movie room.

3.4.2 Measurements were analyzed by ranking VOC concentrations from "1" greatest concentration in parts per billion (ppb) to "3" the third highest concentration in ppb. They were also compared to outdoors levels.

### 3.5 Roof Inspection

A visual inspection of the drainage scuppers, on the south side of the building was performed. This is to insure proper drainage during rains and to avoid puddling and possible roof leakage.

### 3.6 IAQ Meter (Q-TRAK) - Additional Inspection Component

Measurements for 24-hours (around-the-clock/full shift) for temperature, relative humidity, carbon dioxide (CO<sub>2</sub>), and carbon monoxide (CO) were collected in Bedroom #1 and Bedroom #2 on the second floor, and the Captain's Office, Kitchen, and Bedroom #2 on the first floor, and one outdoor location. Measurements were evaluated from location to location and to outdoors levels as well as IAQ standards and guidelines from ASHRAE.

### 3.7 Detailed Inspection of Windows - Additional Inspection Component

3.7.1 Fungal evaluation of windows determined to be leaking during our January 14, 2019 inspection.

3.7.2 This inspection included evaluating the moisture content of the window frame, wall board around the window and structural components below the window using a moisture meter.

3.7.3 Minimal destructive testing (i.e. the removal of the baseboard) at the base of the window was also inspected and included lifting the carpeting for inspection.

### 3.8 Bedbug - Additional Inspection Component

Bedroom mattresses were checked for bedbug debris including stains, and exoskeleton parts and waste products. Two mattresses were sampled using a vacuum capture device for PCR analysis.

## 4.0 METHODS

### 4.1 Environmental Sampling

#### 4.1.1 Fungal Surface (Tape Lift)

The collection of tape lift samples provides the ability to determine if sampled materials are actually fungal in nature. The total spore surface samples were collected using transparent adhesive tape to "trap" the spores and "lift" them from the test surface. The tape then placed on a microscope slide, sticky side down, for laboratory analysis. A measurement of total spore count will provide the relative numbers and types of spores on a specific building surface measured in spores/square millimeter (s/mm<sup>2</sup>). It will also provide data that fungal growth is present, rather than some other non-fungal material, i.e. dirt.

#### 4.1.2 Bedbug Settled Dust (Vacuum Collection Device)

4.1.2.1 Bed mattresses were inspected for stains and particles from bedbugs. Two beds were sampled using a vacuum collection device which catches dust, particles, and debris (i.e. exoskeletons from bed bugs).

4.1.2.2 The samples were then sent for analysis using PCR analysis methodology to determine presence or absence of bedbug DNA.

4.1.2.3 The purpose of PCR testing is to find small amounts of DNA in a collected sample using a process of amplification. During PCR amplification, the DNA of interest (i.e. bedbug) is copied repeatedly until there is enough of it for analysis and detection/identification.

## 4.2 Direct Reading Instrumentation

- 4.2.1 A Delmhorst BD-2100 moisture meter was used to measure the moisture content of building construction materials. This meter measures moisture content of materials based on the electrical resistance of the material. The unit has needle-nail like prongs. The prongs are one half inch (1/2") long and are inserted into the material to be measured. Also, a Tramex handheld moisture meter that was used to measure levels of moisture in building materials. This is a non-destructive type instrument that is based on surface resistance.
- 4.2.2 A RAE ppbRAE 3000 Photo Ionization Detector (PID) which can measure VOC levels in parts per billion (ppb) was used to measure indoor and outdoor VOC levels.
- 4.2.3 A TSI 9306V Aerotrak handheld particle counter was used to measure indoor and outdoor particle levels.
- 4.2.4 Q-TRAK 7575 is a handheld IAQ meter which measures key IAQ indicator parameters including temperature, relative humidity, carbon dioxide (CO<sub>2</sub>), and carbon monoxide (CO).
- 4.2.5 The FLIR infrared camera was used to measure surface temperature of various surfaces in the building. Cold surface areas are represented by "blue", which usually indicate wet areas due to the cooling effect of evaporating moisture on surfaces.

## 4.3 Laboratory

Samples requiring laboratory analysis were submitted to SGS Galson, and LA Testing, Industrial Hygiene laboratory, for analysis following chain of custody (COC) procedures. These laboratories maintain accreditations with the American Industrial Hygiene Association (AIHA) Laboratory Accreditation Program (LAP), LLC, among other accreditations.

## 5.0 STANDARDS AND GUIDELINES

### 5.1 Occupational Exposures

To assess the extent of exposure, survey results are compared with regulatory standards and/or professionally recommended guidelines. For occupational exposures, reference values are published by the American Conference of Governmental Industrial Hygienists (ACGIH) and regulatory standards are set by both federal and state Occupational Safety and Health Administrations, OSHA and Cal/OSHA.

5.1.1 Both the regulatory standards and ACGIH guidelines are designed to protect workers from exposures to unhealthful concentrations of substances. However, the levels established by these bodies may not necessarily eliminate all effects for all people, e.g., mild irritations, response to odors, unique sensitivities, etc.

#### 5.1.2 California OSHA

Regulatory limits are described as permissible exposure limits (PELs), action levels (ALs), ceiling (C) limits, and/or short-term exposure limits (STELs).

#### 5.1.3 ACGIH

The ACGIH identifies its recommendations as threshold limit values (TLVs), ceiling (C) limits, and short-term exposure limits (STELs).

5.1.4 PELs, ALs, and TLVs are expressed as 8-hour TWAs for a normal eight-hour workday and a forty-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.<sup>1</sup> Ceiling limits should never be exceeded, even for brief periods. STELs generally refer to concentrations to which workers can be exposed for a short period of time without suffering from irritation, chronic, or irreversible tissue damage or narcosis of sufficient degree to increase the likelihood of accidental injury, impair self-rescue, or materially reduce work efficiency, and provided that the daily TLV-TWA is not exceeded. The STEL is not a separate, independent exposure limit; rather, it supplements the TWA where there are recognized acute effects from a substance whose toxic effects are primarily of a chronic nature.

---

<sup>1</sup>2019 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, *American Conference of Governmental Industrial Hygienists*, p. 4.



## 5.2 IAQ

- 5.2.1 Sick building syndrome (SBS) and IAQ concerns rarely, if ever, involve exposures to substances at PEL or TLV levels. The control of SBS and IAQ concerns in non-industrial environments are generally based on perceived air quality, ventilation systems' characteristics (CAV, VAV), operational performance, and quality of system maintenance (PM).

### 5.2.1.1 ASHRAE Standard 62.1 - 2010, "Ventilation for Acceptable Indoor Air Quality".<sup>2</sup>

- 5.2.1.1.1 The purpose of this standard is to specify minimum ventilation rates and other measures intended to provide indoor air quality that is acceptable to human occupants and that minimize adverse health effects. The standard is intended to be used as a guide to help improve IAQ in existing buildings or a design standard in construction specifications.

- 5.2.1.1.2 One method to determine acceptable air quality is achieved within the space by controlling identified contaminants of concern (COC) and comparison of their concentration with IAQ references (normal or trigger/action responses); the generally perceived air quality by occupant percentage (if poor then increase fresh air flow); mass balance analysis (air dilution) to determine proper fresh minimum requirements; and/or a variation of Ventilation Rate Procedures and IAQ Procedures.

### 5.2.1.2 ASHRAE Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".<sup>3</sup>

- 5.2.1.2.1 Thermal Environmental Conditions for Human Occupancy specifies the combinations of indoor thermal environmental and personal factors to produce

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<sup>2</sup>American Society of Heating, Refrigerating, and Air-Conditioning Engineers, "Ventilation for Acceptable Indoor Air Quality", ASHRAE 62.1-2010, Atlanta, GA, *American Society of Heating, Refrigerating, and Air-Conditioning Engineers*, 2010.

<sup>3</sup>American Society of Heating, Refrigerating, and Air-Conditioning Engineers, "Thermal Environmental Conditions for Human Occupancy", ASHRAE 55-2010, Atlanta, GA, *American Society of Heating, Refrigerating, and Air-Conditioning Engineers*, 2010.

conditions acceptable to a majority of the occupants within a space.

- 5.2.1.2.2 The factors that describe these conditions include: Metabolic rate, clothing, air and radiant temperatures, air speed (supply air registers), and relative humidity.

- 5.2.2 The following table represents many of the IAQ reference levels that are typically compared with measured contaminate levels in IAQ surveys. Typical indoor concentrations are provided along with levels above identified trigger concentrations indicating the need for further investigations.

Test	Typical Indoor Concentration	Trigger Concentration
Asbestos	<0.01 f/cc	>0.01 f/cc
Bioaerosols	Varies	2-3 Times Greater than Other Spaces or Outdoors
Carbon Dioxide	400-1000 ppm	800 ppm 700 ppm +Background
Carbon Monoxide	1-3 ppm	>5 ppm
Formaldehyde	0.01-0.05 ppm	>0.05 ppm
Moisture	Varies	40- 60 %
Nitrogen Dioxide	0.01-0.05 ppm	>0.05 ppm
Odors	None	Detectable for Extended Time
Ozone	0.01-0.02 ppm	>0.05 ppm
Particles (Dust)	<50 µg/m <sup>3</sup> (total)	>50 µg/m <sup>3</sup>
Radon	<0.5 pCi/L	>4 pCi/L
VOCs	<300 µg/m <sup>3</sup> 1-2 ppm	300 µg/m <sup>3</sup> to 3000 µg/m <sup>3</sup> Depending on Chemicals
Ref. - IAQ and HVAC Workbook, 4th Edition, Revised and Updated 2001, D.Jeff Burton, CIH,PE, CSP, ISBN 1-883992-16-8, Contaminant Concentration Checklist, p. A-27		

Table: Indoor Air Quality Typical and Trigger Levels

### 5.3 Fungal Standards

- 5.3.1 There are no specific federal or state regulations or standards for mold (fungi); however, there are several generalized guidelines. For instance, the "The New York Guidelines", Guidelines on Assessment and Remediation of Fungi in Indoor Environments, New York City Department of Health and Mental Hygiene, November 2008; EPA's Mold Remediation in Schools and Commercial Buildings, EPA, 402-K-01-001, March 2001; or AIHA's Recognition, Evaluation, and Control of Indoor Mold, AIHA, 2008.
- 5.3.2 In lieu of any promulgated regulatory or recommended guidelines for surface levels, professional Industrial Hygiene practitioners have defined a general surface level of under 50 spores per square millimeter (s/mm<sup>2</sup>) as a

concentration that should not produce complaints or allergic reactions. The area is considered to be clean when a surface spore concentration is equal to or less than 10 s/mm<sup>2</sup>.

## 6.0 SURVEY RESULTS, DISCUSSION, AND RECOMMENDATIONS

6.1 The sampling results tables relating to this survey are listed below.

6.1.1 Table I - Results for Visual Inspection.

6.1.2 Table II - Results for Moisture Intrusion Evaluation.

6.1.3 Table III - Air Sampling Results for Particle Counter.

6.1.4 Table IV - Air Sampling Results for Volatile Organic Compounds.

6.1.5 Table V - Results for Total Surface Fungal Spores.

6.1.6 Table VI - Results for Bedbugs.

6.1.7 Table VII - Air Monitoring Results for Q-TRAK.

6.2 Appendices

6.2.1 Laboratory reports are provided in APPENDIX I - Laboratory Reports.

6.2.2 Instrument calibration certifications are provided in APPENDIX II - Instrument Calibration Certifications.

6.2.3 Instrument download data are APPENDIX III - Data Downloads.

6.2.4 Photographs are provided in APPENDIX IV - Photographs.

6.3 Findings

6.3.1 The general cleanliness of the fire station was improved. When inspecting horizontal surfaces “white glove tests” the following areas stood out as having more dirt/grime than others. They were the locker room and the 2<sup>nd</sup> Floor Bed Room. See photographs DSCN3712, DSCN3713, and DSCN3714 which depict these conditions.

6.3.2 The IAQ parameter measurements determined the results were not remarkable as compared to guidelines or the ambient outdoor concentrations.

- 6.3.3 Particle count levels were higher outdoors than indoors for midrange particles ranging from 0.5  $\mu\text{m}$  to 3  $\mu\text{m}$ . The shower/bathroom on the first floor and kitchen were higher than outdoors for small, 0.3  $\mu\text{m}$  and large 5  $\mu\text{m}$  to 10  $\mu\text{m}$  particle range. Overall total counts were 1.7 times higher this quarter than last quarter's data.
- 6.3.4 The HVAC system inspection showed that the return air filters were loaded with dust and were being changed (not neglected) as the most recent change date was 3/22/19 (about a month prior to this survey date). See photographs DSCN3775 - DSCN3783.
- 6.3.5 Inspection of the HVAC unit in the attic showed that the cooling coil and condensate pan were clean (new in fact). However, the fresh air intake was not connected. According to the HVAC technician working with HSA, the system is scheduled for upgrade with UV lights, etc. HSA assumes fresh air will be connected in at that time or has been planned for at that time.
- 6.3.6 There were two areas inspected for mold and moisture where the baseboard and carpeting was moved back for detailed inspection. These areas included the 1<sup>st</sup> Floor Bed Room #2 and 2<sup>nd</sup> Floor Bed Room #1. Both areas were dry and no mold was found. No observable work has been done to these windows to correct water leakage. See photographs DSCN3785 to DSCN3808 for the 1<sup>st</sup> Floor Bedroom Window and DSCN3809 to DSCN3832.
- 6.3.7 Total VOCs were 8.5 times higher this quarter than last quarter's data. The indoor levels were 5 times higher than outdoors (background). They were still within IAQ Normal Limits. Another possible reason for higher VOC levels is lack of a fresh air intake for the HVAC unit.
- 6.3.8 Inspection of the crawlspace was similar as the prior inspection. Samples were collected of areas pointed out as being of a concern. The sampling results of these locations were negative for fungal. See Table V - Results for Total Surface Fungal Spores. No observable work was done to repair drainage of leaks from rains were observed.
- 6.3.9 The wood shelf in the 1<sup>st</sup> Floor Bathroom was removed.
- 6.3.10 The roof drains on the second floor balcony still need to be cleaned of leaves and other trash.
- 6.3.11 No evidence of the presence of Bed Bugs were determined by laboratory analysis of dust and debris collected using a vacuum and sample collection device. Analysis was via PCR (DNA).

- 6.3.12 Inspection of the laundry room showed water was present under the rug. The water leak HSA believed was from a washing machine. This finding was immediately mentioned to HSA's contact for prompt action to prevent possible mold growth.
- 6.3.13 The station needs repairs that may not necessary be associated with dust or mold and is mentioned as possible improvements.
- 6.3.13.1 Remove carpeting to facilitate easier cleaning.
  - 6.3.13.2 Repair all windows. Windows appear rotted from observations made from the outside. The repairs should be performed inside of a containment as a precaution as fungal growth may exist. If fungal growth is determined to exist, then following the general procedures as outline in our previous remediation guideline for this location, including post remediation sampling would be prudent (see HSA Project number 180034LA).
  - 6.3.13.3 Clean the old hose tower of dust accumulation and repair electrical deficiencies.
  - 6.3.13.4 Repair drainage of the building (south side). It was observed that the side of the fire station floods when it rains. See past report photographs.
  - 6.3.13.5 There are many areas in side the fire station where there are cracking and/or blistering paint and wall plaster. These areas should all be inspected. The extent of inspection may need to include destructive testing and required protocols.
  - 6.3.13.6 The exhaust system for the fire station engines should be exhausted further away from any intakes, windows, and/or vents and louvers where infiltration into the building could occur.
  - 6.3.13.7 The attic should be inspected in a comprehensive manner. Access points should be provided and all areas should have boards across joists (catwalk) so as not to damage ceiling components, etc.
  - 6.3.13.8 Access points to the crawlspace should be made at all areas of the building requiring quarterly inspections (floor hatches).



6.3.13.9 A comparison of this fire station with newly designed fire stations is recommended and fire station population numbers and work loads/equipment. This station approximately 80 years old.

Table I - Results for Visual Inspection.

City of Long Beach  
3917 Long Beach Blvd.  
Long Beach, California 90807  
April 22-23, 2019

Description	Evaluation	Comment
General Areas	Satisfactory	Improved
Exercise Room	Satisfactory	Improved
Captain's Office	Satisfactory	Improved
1st Floor Bathroom Shower Room	Satisfactory	Improved
Garage	Satisfactory	Disconnected emission exhaust from trucks.
2nd Floor TV Room	Satisfactory	Improved
Kitchen	Satisfactory	Improved
Locker Room	Failure	Horizontal Surfaces Dusty/Grimy (white glove tests) in Locker Room (Photo DSCN3712 and DSCN3713)
Bedroom #1 2 <sup>nd</sup> Floor	Failure	Horizontal Surfaces Dusty/Grimy (white glove tests) in Bedroom #1 2 <sup>nd</sup> Floor (Photo DSCN3714)
Horizontal Surfaces Dusty/Grimy (white glove tests)		

Table II - Results for Moisture Intrusion Evaluation.

City of Long Beach  
3917 Long Beach Blvd.  
Long Beach, California 90807  
April 22-23, 2019

Description	Evaluation	Comment
General Areas	Satisfactory	
Attic Space	Satisfactory	Area of focus (above kitchen) was unchanged. Water staining and dry. Photos DSCN3738 - DSCN3744.  In general there are many areas where there are water stains. Some areas in attic have not been inspected. Provided safe access (catwalks) and is of focus of inspection. Photo DSCN3715 - DSCN3737.
Crawlspace Photos DSCN3833-DSCN3868	Satisfactory	Soil appears moist from past rains.  No work has been done to repair water intrusion from rains.  Samples collected of suspect mold. White fuzzy material on foundation wall, on wood, and on soil. Pointed out areas. See Table V. No mold found.  Crawlspace appears worse than it is; however, there are areas where wood is wet from prior rains or plumbing leaks. Photos DSCN3843, DSCN3866 (marginal), and DSCN3868 (marginal).  Repair drainage of rain water.
Under Stairwell Closet (Crawlspace Access)	Satisfactory	Framing wood during construction of building was covered with cement/plaster and appears dirty. Otherwise Dry. Unchanged.
Exercise Room	Satisfactory	
Captain's Office	Satisfactory	Brown spots above shower from moisture from showers pointed out. Ventilation maybe needed and improved cleaning.
1st Floor Bathroom Shower Room	Satisfactory	Cabinet shelf was removed which appeared black.  Ceiling blistering was pointed out.
Garage	Satisfactory	

Table II (Cont'd) - Results for Moisture Intrusion Evaluation.

City of Long Beach  
3917 Long Beach Blvd.  
Long Beach, California 90807  
April 22-23, 2019

Description	Evaluation	Comment
1st Floor Hallway.	Satisfactory	Wall leading to TV Room has blistering as pointed out. Photo DSCN3650. Photo DSCN3653 window frame rotting.  There are many areas in building similar to the condition depicted. Unless destructive testing is conducted some of these areas may or may not have mold.
1 <sup>st</sup> Floor Bedroom #2	Satisfactory	Room #2 window dry. White material on window was tested (Photo DSCN3796). No mold detected or other suspect visible mold observed. Photos DSCN3785 - DSCN3807.  No work has been done to this window to repair water leak.
2nd Floor Bedroom #1	Satisfactory	Room #1 window dry. No visible suspect mold observed. Room #3 repairs around window (Staining/Blistering but Dry).
Kitchen	Satisfactory	
Roof Drains (South Side)	Un-Satisfactory	Papers/debris present. Cleaning needed.
<b>Instrumentation:</b> Tramex Moisture Encounter Plus, and Delmhorst		

Table III - Air Sampling Results for Particle Counter.

City of Long Beach  
3917 Long Beach Blvd.  
Long Beach, California 90807  
April 22-23, 2019

Particle Size Distribution	Exercise Room	Captains Office	Kitchen	Garage	Outside Front	Locker Area	Shower/Bathroom	TV Room	Rank Order (1, 2, and 3)
0.3 µm	144308	129884	141514	102686	135559	129408	163768	152190	<b>2<sup>nd</sup> Qtrtr</b> 1 Shower, 2 TV, 3 Ex
0.5 µm	18199	17994	18091	30546	32192	20310	20979	18494	<b>2<sup>nd</sup> Qtrtr</b> 1 Out, 2 Eng, 3 Shower
1.0 µm	5747	5863	5456	12333	12835	6773	7086	5397	<b>2<sup>nd</sup> Qtrtr</b> 1 Out, 2 Eng, 3 Shower
3.0 µm	831	837	959	1158	1191	666	654	662	<b>2<sup>nd</sup> Qtrtr</b> 1 Out, 2 Eng, 3 Kitchen
5.0 µm	336	302	401	294	293	194	178	252	<b>2<sup>nd</sup> Qtrtr</b> 1 Kit, 2 Exer, 3 Cap
10 µm	61	38	94	23	32	36	27	56	<b>2<sup>nd</sup> Qtrtr</b> 1 Kit, 2 Exer, 3 TV
<b>Abbreviation:</b> µm=micro meters									





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Table IV - Air Sampling Results for Volatile Organic Compounds.

City of Long Beach  
3917 Long Beach Blvd.  
Long Beach, California 90807  
April 22-23, 2019

Description	Exercise Room	Captains Office	Kitchen	Garage	Outside Front	Locker Area	Shower/Bathroom	TV Room	Rank Order (1, 2, and 3)
VOCs (ppb)	155	156	300	70	35	180	210	215	2 <sup>nd</sup> Qtr 1 Kitchen 2 TV Room 3 Shower/Bath
Abbreviation: ppb=parts per billion; Normal Levels = 1-2 ppm (1000-2000 ppb)									

Table V - Results for Total Surface Fungal Spores.

City of Long Beach  
3917 Long Beach Blvd.  
Long Beach, California 90807  
April 22-23, 2019

Description	Bedroom #2 1 <sup>st</sup> Floor Window Sil Photo DSCN3796	Crawlspace On Wall 2" from Dirt Ground Photo DSCN3840	Crawlspace On Wood near Pipe Photo DSCN3855	Crawlspace on Wood Photo DSCN3845	Crawlspace On Dirt Ground near Cables Photo DSCN3864	Field Blank
Media	Tape Lift	Tape Lift	Tape Lift	Tape Lift	Tape Lift	Tape Lift
Sample Number	19042301	19042302	19042303	19042304	19042305	19042306
Units	Percent (%)	Percent (%)	Percent (%)	Percent (%)	Percent (%)	Percent (%)
Ascospores	-	-	-	3%	-	-
Basidiospores	-	100%	88%	24%	-	-
Alternaria (Ulocladium)	-	-	-	3%	-	-
Cladosporium sp.	-	-	12%	7%	-	-
Hyaline spores	100%	-	-	62%	-	-
Myxomycetes sp.	-	-	-	-	100%	-
Total Fungi (spores/mm <sup>2</sup> )	1	2	7	24	1	None Detected
Evaluation	Does not Indicate Fungal Low spores/mm <sup>2</sup> below Remediation Clearance Level	Does not Indicate Fungal Low spores/mm <sup>2</sup> below Remediation Clearance Level	Does not Indicate Fungal Low spores/mm <sup>2</sup> below Remediation Clearance Level	Does not Indicate Fungal Low spores/mm <sup>2</sup> below Remediation Clearance Level	Does not Indicate Fungal Low spores/mm <sup>2</sup> below Remediation Clearance Level	NA
Abbreviations: NA = Not Applicable; @=Active fertile colony						



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Table VI - Results for Bedbugs.

City of Long Beach  
3917 Long Beach Blvd.  
Long Beach, California 90807  
April 22-23, 2019

Sample #	Media	Location/Description/Remarks	Present/Absent	Indicator
19042201	Vac Tube	1st Floor, Bedroom #2, Mattress	Absent	No Bed Bugs Detected
19042202	Vac Tube	2nd Floor, Bedroom #3, Mattress	Absent	No Bed Bugs Detected
Abbreviations: #=Number				

Table VII - Air Monitoring Results for Q-TRAK.

City of Long Beach  
3917 Long Beach Blvd.  
Long Beach, California 90807  
April 22-23, 2019

Parameters	Statistics	Bedroom #1 2 <sup>nd</sup> Floor Photo DSCN3703	Bedroom #3 2 <sup>nd</sup> Floor Photo DSCN3705	Captain's Room 1 <sup>st</sup> Floor Photo DSCN3707	Kitchen 1 <sup>st</sup> Floor Photo DSCN3708	Bedroom #2 1 <sup>st</sup> Floor Photo DSCN3710	Outside Front by Black Gate Photo DSCN3711	ASHRAE
Instrument		TSI Q-TRAK	TSI Q-TRAK	TSI Q-TRAK	TSI Q-TRAK	TSI Q-TRAK	TSI Q-TRAK	
Sample Number		FA01501 7575X142500 2	FA01497 7575X142500 3	FA00091 7575X114100 3	038180 7575X171601 1	FA00101 T75751139001	FA00221 7565X101300 5	
Time		1025-1347 (1347)	1027-1348 (1348)	1033-1345 (1633)	1036-1345 (1628)	1038-1344 (1392)	1051-1340 (1609)	
Temperature (°F)	Minimum	68	62	64	69	63	57	Normal Range  68-79 °F
	Maximum	72	68	74	80	71	85	
	Average	70	65	70	72	67	75	
Relative Humidity (%RH)	Minimum	38	46	45	38	35	38	Normal Range  30-70%
	Maximum	54	78	70	59	60	95	
	Average	45	52	48	48	44	48	
Carbon Dioxide (ppm)	Minimum	534	577	563	561	395	351	Normal Range  <Bkg + 700ppm or 1000 ppm
	Maximum	1112	1727	1381	2017	1387	442	
	Average	824	880	865	906	809	375	
Carbon Monoxide (ppm)	Minimum	0	0	0	0.4	0	0	Normal Range  < 5ppm
	Maximum	1	1	2	6	2	1	
	Average	0.2	0.04	0.3	2	1	0.4	
Evaluation	N/A	Normal	Normal	Normal	Normal	Normal	N/A	N/A
Abbreviations: F=Fahrenheit; %=percent; ppm=parts per million; Bkg = Background.								

## **APPENDIX I - Laboratory Reports.**





# LA Testing

5431 Industrial Drive Huntington Beach, CA 92649  
Phone/Fax: (714) 828-4999 / (714) 828-4944  
<http://www.LATesting.com> / [gardengrovelab@lateesting.com](mailto:gardengrovelab@lateesting.com)

Order ID: 331908844  
Customer ID: 32HEAL56  
Customer PO:  
Project ID:

**Attn:** Lab results  
Health Science Associates  
10771 Noel Street  
Los Alamitos, CA 90720

Phone: (714) 220-3922  
Fax:  
Collected: 04/23/2019  
Received: 04/26/2019  
Analyzed: 05/02/2019

**Proj:** 190235LA / City of Long Beach

## Test Report: Extended Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Swab Samples (EMSL Method MICRO-SOP-200)

Lab Sample Number	Client Sample ID	Location	Fungal Identification	Category
331908844-0002	19042302	Crawl space, on wall 2 inches from dirt ground	Basidiospores	100%
Total spores per mm sq = 2				
331908844-0005	19042305	Crawl space, on dirt ground near cables	Myxomycetes sp.	100%
Total spores per mm sq = 1				

No discernable field blank was submitted with this group of samples.

### Report Comment: Sample 19042304: Hyphal fragments numerous.

Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut  
\* = Sample contains fruiting structures and/or hyphae associated with the spores.  
- Denotes Not Detected

Category	Count/area Analyzed
Rare	1 to 10
Low	11 to 100
Medium	101 to 1000
High	> 1000

Cecil Strait, Micro Laboratory Manager  
or Other Approved Signatory

Samples were received in good condition unless otherwise noted on this report.  
\* Sample contains fruiting structures and/or hyphae associated with the spores.

AIHA-LAP, LLC--EMLAP Accredited #101650

Initial report from: 05/03/2019 10:16:37

For Information on the fungi listed in this report please visit the Resources section at [www.emsl.com](http://www.emsl.com)



# LA Testing

5431 Industrial Drive Huntington Beach, CA 92649  
Phone/Fax: (714) 828-4999 / (714) 828-4944  
<http://www.LATesting.com> / [gardengrovelab@lateesting.com](mailto:gardengrovelab@lateesting.com)

Order ID: 331908844  
Customer ID: 32HEAL56  
Customer PO:  
Project ID:

**Attn:** Lab results  
Health Science Associates  
10771 Noel Street  
Los Alamitos, CA 90720

**Phone:** (714) 220-3922  
**Fax:**  
**Collected:** 04/23/2019  
**Received:** 04/26/2019  
**Analyzed:** 05/02/2019

**Proj:** 190235LA / City of Long Beach

## Test Report: Extended Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Tape Samples (EMSL Method MICRO-SOP-200)

Lab Sample Number	Client Sample ID	Location	Fungal Identification	Category
331908844-0001	19042301	1st floor, bedroom #2, window sill	Hyaline spores	100%
Total spore per mm sq = 1				
331908844-0003	19042303	Crawl space, on wood near pipe	Basidiospores	88%
			Cladosporium sp.	12%
Total spore per mm sq = 7				
331908844-0004	19042304	Crawl space, on wood	Alternaria (Ulocladium)	3%
			Ascospores	3%
			Basidiospores	24%
			Cladosporium sp.	7%
			Hyaline spores	62%
Total spore per mm sq = 24				
331908844-0006	19042306	Field blank	None Detected	
Total spore per mm sq = N/A				

### Report Comment: Sample 19042304: Hyphal fragments numerous.

Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut  
\* = Sample contains fruiting structures and/or hyphae associated with the spores.  
- Denotes Not Detected

Category	Count/area Analyzed
Rare	1 to 10
Low	11 to 100
Medium	101 to 1000
High	> 1000

Samples were received in good condition unless otherwise noted on this report.  
\* Sample contains fruiting structures and/or hyphae associated with the spores.

AIHA-LAP, LLC--EMLAP Accredited #101650

Cecil Strait, Micro Laboratory Manager  
or Other Approved Signatory

Initial report from: 05/03/2019 10:16:37

For Information on the fungi listed in this report please visit the Resources section at [www.emsl.com](http://www.emsl.com)

**SURFACE SAMPLING DATA SHEET**

<b>TAT</b>  <b>1 Week</b>	<b>Project Manager:</b>	Joel Berman	<b>Project #:</b>	190235LA	<b>Date:</b>	4/23/2019
	<b>Client:</b>	City of Long Beach	<b>Industrial Hygienist:</b>	Howard Ozar	Renee Medina	
	<b>Project Location:</b>	3917 Long Beach Blvd Long Beach, CA 90802	<b>Comments:</b>			

☐ IAQ
 ☐ OSHA Compliance
 ☐ Abatement/Clearance
 ☐ Routine Inspection
 ☐ Background

Sample #	Sample Type	Analysis Method Requested	Location/Description/Remarks
19042301	Tape Lift	M170	1st Floor, Bedroom #2, Window Sil
19042302	Tape Lift	M170	Crawl Space, On Wall 2 Inches From Dirt Ground
19042303	Tape Lift	M170	Crawl Space, On Wood Near Pipe
19042304	Tape Lift	M170	Crawl Space, On Wood
19042305	Tape Lift	M170	Crawl Space, On Dirt Ground Near Cables
19042306	Tape Lift	M170	Field Blank

**Special Instructions to Laboratory:**

Relinquished by: <i>Howell On</i>	Date: <i>4/26/19</i>	Time: <i>15:20</i>	Received by: <i>[Signature]</i>	Date: <i>4/26/19</i>	Time: <i>15:20</i>
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:



EMSL Analytical, Inc.  
200 Route 130 North, Cinnaminson, NJ 08077  
Phone/Fax: (800) 220-3675 / 786-0262  
<http://www.emsl.com> E-mail: [DNALab2@emsl.com](mailto:DNALab2@emsl.com)

EMSL Order: **611900875**  
CustomerID: **32HEAL56**  
Customer PO:  
ProjectID:

Attn: **Joel Berman**  
**Health Science Associates**  
**10771 Noel Street**

**Los Alamitos, CA 90720**  
Project: City of Long Beach/Project #: 190235LA

Phone: (714) 220-3922  
Fax:  
Collected:  
Received: 4/29/2019  
Analysis date: 5/2/2019

### Analytical Results

EMSL - Results	Bed Bugs ( <i>Cimex lectularius</i> ) Analysis by PCR	EMSL Test code: M146
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Lab Sample Number	Client Sample ID	Location	Sample Size	Present/Absent	Indicator
611900875-1	19042201	1st Floor, Bedroom #2, Mattress	5 mg Dust	Absent	
611900875-2	19042202	2nd Floor, Bedroom #3, Mattress	5 mg Dust	Absent	

Interpretation Key	
	Bed Bugs Detected.
	No Bed Bugs Detected.

EMSL maintains liability limited to cost of analysis. Interpretation of the data contained in this report is the responsibility of the client. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. The above test report relates only to the items tested. EMSL bears no responsibility for sample collection activities or analytical method limitations.

Initial Report From: 5/6/2019  
Amended Report From: Initial Report

Approved EMSL Signatory  
Sergey Balashov, Ph.D.

Please visit our website at <http://www.microbiologytestinglab.com/>

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**Important Terms, Conditions, and Limitations****A. Sample Retention**

Samples analyzed by EMSL will be retained for 60 days after analysis date. Storage beyond this period is available for a fee with written request prior to the initial 30 day period. Samples containing hazardous/toxic substances which require special handling will be returned to the client immediately. EMSL reserves the right to charge a sample disposal fee or return samples to the client.

**B. Change Orders and Cancellation**

All changes in the scope of work or turnaround time requested by the client after sample acceptance must be made in writing and confirmed in writing by EMSL. If requested changes result in a change in cost the client must accept payment responsibility. In the event work is cancelled by a client, EMSL will complete work in progress and invoice for work completed to the point of cancellation notice. EMSL is not responsible for holding times that are exceeded due to such changes.

**C. Warranty**

EMSL warrants to its clients that all services provided hereunder shall be performed in accordance with established and recognized analytical testing procedures and with reasonable care in accordance with applicable federal, state and local laws. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied. EMSL disclaims any other warranties, express or implied, including a warranty of fitness for particular purpose and warranty of merchantability.

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In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. EMSL will not be held responsible for the improper selection of sampling devices even if we supply the device to the user. The user of the sampling device has the sole responsibility to select the proper sampler and sampling conditions to insure that a valid sample is taken for analysis. Any resampling performed will be at the sole discretion of EMSL, the cost of which shall be limited to the reasonable value of the original sample delivery group (SDG) samples. In no event shall EMSL be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder.

**E. Indemnification**

Client shall indemnify EMSL and its officers, directors and employees and hold each of them harmless for any liability, expense or cost, including reasonable attorney's fees, incurred by reason of any third party claim in connection with EMSL's services, the test result data or its use by client.

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**BULK SAMPLING DATA SHEET**

3 DAY TAT (MO) 4/29/19  
2 4/10/19  
1 Week 4/22/19

**Project Manager:** Noel Berman  
**Client:** City of Long Beach  
**Project Location:** 3917 Long Beach Blvd  
Long Beach, CA 90802

**Project #:** 190235LA  
**Date:** 4/22/2019  
**Industrial Hygienist:** Howard Ozar  
Renee Medina  
**Comments:**

☐ Compliance ☐ Routine ☐ Background

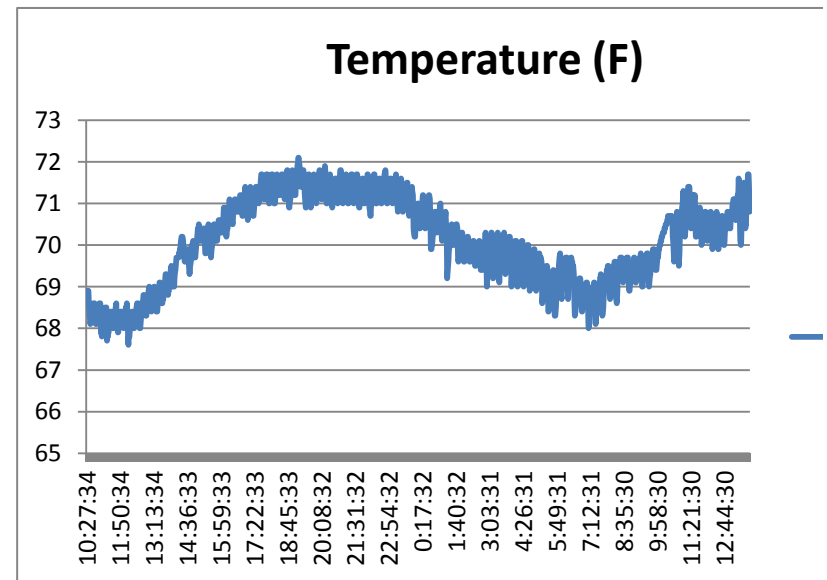
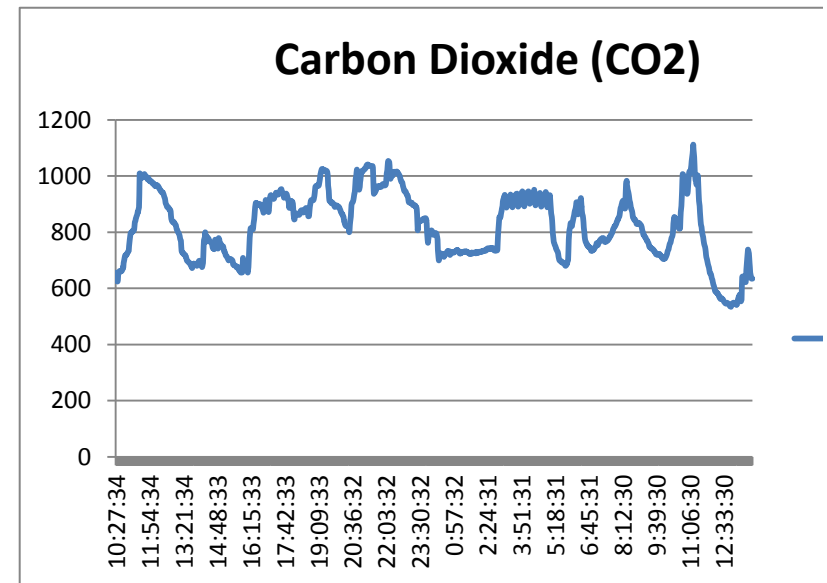
Sample #	Sample Collection (glass jar, plastic bag, etc.)	Description of Sample Collected (e.g., drywall, metal, debris, etc.)	Analysis Method Requested	Time Sample was Collected	Amount (e.g., ft <sup>2</sup> , in <sup>2</sup> )	Location/Description/Remarks
19042201	Vac Tube	Debris	Bed Bug Cimex lecturarius, qPCR (M146)			1st Floor, Bedroom #2, Mattress
19042202	Vac Tube	Debris	Bed Bug Cimex lecturarius, qPCR (M146)			2nd Floor, Bedroom #3, Mattress

**Special Instructions to Laboratory:**

Relinquished by: <i>Howard Ozar</i>	Date: <i>4/26/19</i>	Time: <i>1520</i>	Received by: <i>[Signature]</i>	Date: <i>4/26/19</i>	Time: <i>1520</i>
Relinquished by:	Date:	Time:	Received by: <i>CK</i>	Date: <i>4/26/19</i>	Time: <i>1000</i>
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

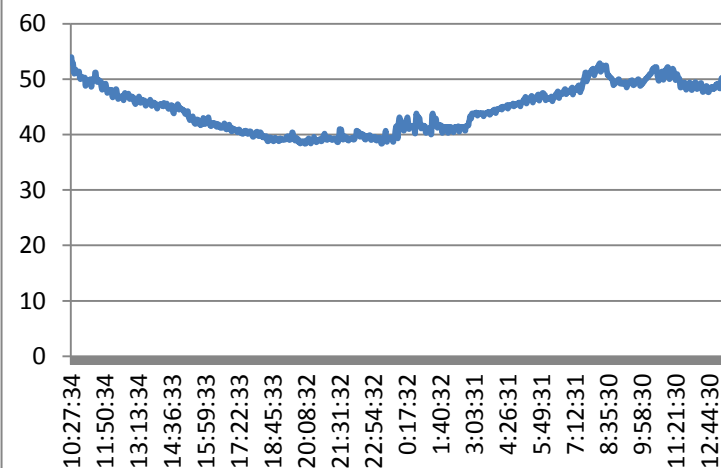
## **APPENDIX II - Instrument Calibration Certifications.**

Date	Time	CO2	T	H	CO
Minutes		1641	1641	1641	1641
Minimum		534	67.6	38.3	0
Maximum		1112	72.1	54	1.4
Average		824.1347	69.69556	44.69798	0.163911
4/22/2019	10:27:34	635	68.9	53.9	0
4/22/2019	10:28:34	656	68.9	54	0
4/22/2019	10:29:34	632	68.9	53.4	0
4/22/2019	10:30:34	624	68.9	53.1	0
4/22/2019	10:31:34	624	68.9	52.8	0
4/22/2019	10:32:34	629	68.9	52.9	0
4/22/2019	10:33:34	649	68.7	52.4	0
4/22/2019	10:34:34	655	68.5	51.4	0
4/22/2019	10:35:34	658	68.3	51	0
4/22/2019	10:36:34	662	68.2	51.5	0
4/22/2019	10:37:34	662	68.1	51.7	0
4/22/2019	10:38:34	660	68.2	51.7	0
4/22/2019	10:39:34	661	68.2	51.5	0
4/22/2019	10:40:34	661	68.3	51.4	0
4/22/2019	10:41:34	664	68.4	51.3	0
4/22/2019	10:42:34	662	68.5	51.1	0
4/22/2019	10:43:34	664	68.5	51.1	0
4/22/2019	10:44:34	669	68.6	51.1	0
4/22/2019	10:45:34	676	68.6	51.3	0
4/22/2019	10:46:34	674	68.6	51.3	0
4/22/2019	10:47:34	690	68.6	51.4	0
4/22/2019	10:48:34	702	68.5	50.8	0
4/22/2019	10:49:34	709	68.3	50.3	0
4/22/2019	10:50:34	714	68.1	50	0
4/22/2019	10:51:34	718	68.1	50.2	0
4/22/2019	10:52:34	719	68.1	50.4	0
4/22/2019	10:53:34	718	68.2	50.4	0
4/22/2019	10:54:34	721	68.3	50.4	0
4/22/2019	10:55:34	721	68.3	50.3	0

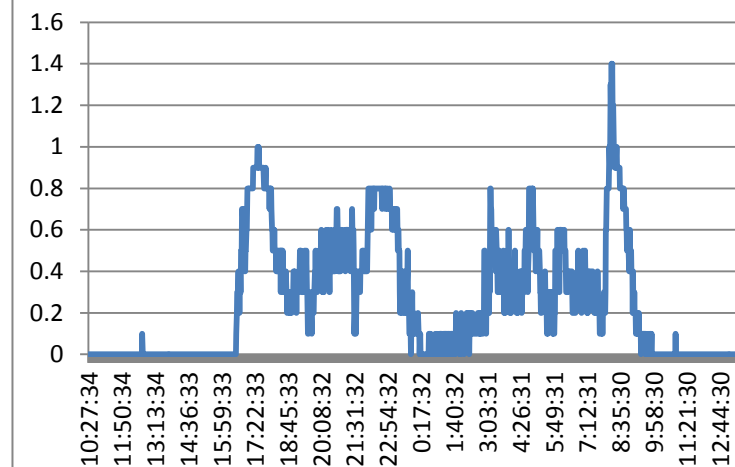


4/22/2019	10:56:34	726	68.4	50.3	0
4/22/2019	10:57:34	727	68.5	50.3	0
4/22/2019	10:58:34	730	68.5	50.3	0
4/22/2019	10:59:34	734	68.6	50.3	0
4/22/2019	11:00:34	734	68.6	50.3	0
4/22/2019	11:01:34	751	68.6	50.3	0
4/22/2019	11:02:34	772	68.5	49.5	0
4/22/2019	11:03:34	782	67.9	48.8	0
4/22/2019	11:04:34	791	67.9	49	0
4/22/2019	11:05:34	797	67.8	49.6	0
4/22/2019	11:06:34	798	67.9	49.7	0
4/22/2019	11:07:34	800	67.9	49.8	0
4/22/2019	11:08:34	800	68	49.7	0
4/22/2019	11:09:34	801	68.1	49.6	0
4/22/2019	11:10:34	805	68.2	49.6	0
4/22/2019	11:11:34	803	68.3	49.5	0
4/22/2019	11:12:34	804	68.4	49.5	0
4/22/2019	11:13:34	807	68.5	49.6	0
4/22/2019	11:14:34	810	68.5	49.6	0
4/22/2019	11:15:34	823	68.5	50	0
4/22/2019	11:16:34	836	68.5	49.4	0
4/22/2019	11:17:34	841	67.9	48.6	0
4/22/2019	11:18:34	849	67.7	48.7	0
4/22/2019	11:19:34	851	67.8	49.4	0
4/22/2019	11:20:34	856	67.8	49.6	0
4/22/2019	11:21:34	861	67.9	49.9	0
4/22/2019	11:22:34	866	67.9	49.9	0
4/22/2019	11:23:34	873	68	50.1	0
4/22/2019	11:24:34	872	68.1	50	0
4/22/2019	11:25:34	878	68.1	50.2	0
4/22/2019	11:26:34	889	68.2	50.4	0
4/22/2019	11:27:34	931	68.4	51.2	0
4/22/2019	11:28:34	1009	68.4	51.2	0
4/22/2019	11:29:34	1009	68.2	50.6	0

### Humidity (%)



### Carbon Monoxide (CO)



4/22/2019	11:30:34	1000	68.3	50.2	0
4/22/2019	11:31:34	994	68.2	49.8	0
4/22/2019	11:32:34	996	68	49.5	0
4/22/2019	11:33:34	995	68	49.8	0
4/22/2019	11:34:34	996	68	49.9	0
4/22/2019	11:35:34	998	68.1	49.9	0
4/22/2019	11:36:34	994	68.2	49.8	0
4/22/2019	11:37:34	1000	68.3	49.7	0
4/22/2019	11:38:34	1000	68.4	49.6	0
4/22/2019	11:39:34	999	68.5	49.6	0
4/22/2019	11:40:34	1007	68.5	49.6	0
4/22/2019	11:41:34	1005	68.6	49.6	0
4/22/2019	11:42:34	1004	68.3	48.8	0
4/22/2019	11:43:34	1000	68.1	48.2	0
4/22/2019	11:44:34	999	68	48.1	0
4/22/2019	11:45:34	996	67.9	48.8	0
4/22/2019	11:46:34	997	67.9	49	0
4/22/2019	11:47:34	995	68	49	0
4/22/2019	11:48:34	991	68.1	49	0
4/22/2019	11:49:34	988	68.2	49	0
4/22/2019	11:50:34	993	68.3	48.9	0
4/22/2019	11:51:34	987	68.4	49	0
4/22/2019	11:52:34	986	68.4	49.1	0
4/22/2019	11:53:34	983	68.4	49.2	0
4/22/2019	11:54:34	985	68.4	48.6	0
4/22/2019	11:55:34	982	68.4	48	0
4/22/2019	11:56:34	982	68.3	47.9	0
4/22/2019	11:57:34	982	68.1	47.5	0
4/22/2019	11:58:34	979	68.1	47.6	0
4/22/2019	11:59:34	979	68	47.8	0
4/22/2019	12:00:34	978	68.1	47.9	0
4/22/2019	12:01:34	976	68.1	48	0
4/22/2019	12:02:34	973	68.2	48	0
4/22/2019	12:03:34	974	68.3	48	0



4/22/2019	12:04:34	971	68.4	48	0
4/22/2019	12:05:34	972	68.5	48.1	0
4/22/2019	12:06:34	970	68.5	48	0
4/22/2019	12:07:34	966	68.6	48.1	0
4/22/2019	12:08:34	964	68.5	47.5	0
4/22/2019	12:09:34	966	68.1	46.8	0
4/22/2019	12:10:34	964	67.7	46.7	0
4/22/2019	12:11:34	966	67.6	47.3	0
4/22/2019	12:12:34	968	67.8	47.7	0
4/22/2019	12:13:34	964	67.8	47.8	0
4/22/2019	12:14:34	966	67.9	47.8	0
4/22/2019	12:15:34	965	68	47.8	0
4/22/2019	12:16:34	962	68.1	47.8	0
4/22/2019	12:17:34	962	68.2	47.9	0
4/22/2019	12:18:34	958	68.3	48.2	0
4/22/2019	12:19:34	953	68.3	48.2	0
4/22/2019	12:20:34	952	68.4	48	0
4/22/2019	12:21:34	950	68.4	47.2	0
4/22/2019	12:22:34	949	68.3	46.7	0
4/22/2019	12:23:34	945	68.2	46.6	0
4/22/2019	12:24:34	943	68	46.4	0
4/22/2019	12:25:34	942	68	46.6	0
4/22/2019	12:26:34	942	68.1	46.8	0
4/22/2019	12:27:34	940	68.1	46.8	0
4/22/2019	12:28:34	941	68.2	46.8	0
4/22/2019	12:29:34	936	68.3	46.8	0
4/22/2019	12:30:34	934	68.4	46.8	0
4/22/2019	12:31:34	929	68.5	46.8	0
4/22/2019	12:32:34	923	68.6	46.9	0
4/22/2019	12:33:34	921	68.6	46.9	0
4/22/2019	12:34:34	914	68.6	47	0
4/22/2019	12:35:34	904	68.6	46.7	0
4/22/2019	12:36:34	901	68.4	46.4	0
4/22/2019	12:37:34	896	68.2	46.2	0

4/22/2019	12:38:34	892	68.1	46.9	0
4/22/2019	12:39:34	890	68	47.2	0
4/22/2019	12:40:34	889	68	47.5	0
4/22/2019	12:41:34	887	68.1	47.4	0.1
4/22/2019	12:42:34	888	68.2	47.4	0
4/22/2019	12:43:34	886	68.3	47.3	0
4/22/2019	12:44:34	884	68.4	47.2	0
4/22/2019	12:45:34	880	68.5	47.1	0
4/22/2019	12:46:34	881	68.6	47.1	0
4/22/2019	12:47:34	878	68.7	47	0
4/22/2019	12:48:34	874	68.8	47.1	0
4/22/2019	12:49:34	858	68.8	47.4	0
4/22/2019	12:50:34	847	68.8	47	0
4/22/2019	12:51:34	839	68.6	46.6	0
4/22/2019	12:52:34	838	68.5	46.4	0
4/22/2019	12:53:34	836	68.4	46.4	0
4/22/2019	12:54:34	836	68.3	46.7	0
4/22/2019	12:55:34	837	68.3	46.8	0
4/22/2019	12:56:34	836	68.4	46.9	0
4/22/2019	12:57:34	833	68.5	46.9	0
4/22/2019	12:58:34	831	68.6	46.9	0
4/22/2019	12:59:34	830	68.7	46.8	0
4/22/2019	13:00:34	827	68.8	46.7	0
4/22/2019	13:01:34	826	68.9	46.7	0
4/22/2019	13:02:34	820	69	46.6	0
4/22/2019	13:03:34	814	68.9	46.2	0
4/22/2019	13:04:34	809	68.8	45.8	0
4/22/2019	13:05:34	807	68.7	45.7	0
4/22/2019	13:06:34	802	68.6	45.5	0
4/22/2019	13:07:34	800	68.5	45.8	0
4/22/2019	13:08:34	799	68.4	46.1	0
4/22/2019	13:09:34	797	68.5	46.3	0
4/22/2019	13:10:34	790	68.5	46.4	0
4/22/2019	13:11:34	787	68.6	46.4	0

4/22/2019	13:12:34	780	68.8	46.4	0
4/22/2019	13:13:34	775	68.9	46.4	0
4/22/2019	13:14:34	770	69	46.5	0
4/22/2019	13:15:34	749	69	46.9	0
4/22/2019	13:16:34	734	68.9	46.5	0
4/22/2019	13:17:34	729	68.8	46.2	0
4/22/2019	13:18:34	729	68.7	45.9	0
4/22/2019	13:19:34	726	68.5	45.7	0
4/22/2019	13:20:34	723	68.4	45.8	0
4/22/2019	13:21:34	724	68.4	46.2	0
4/22/2019	13:22:34	722	68.4	46.3	0
4/22/2019	13:23:34	721	68.5	46.3	0
4/22/2019	13:24:34	720	68.7	46.2	0
4/22/2019	13:25:34	719	68.8	46.1	0
4/22/2019	13:26:34	714	68.9	46.1	0
4/22/2019	13:27:34	715	69	46.1	0
4/22/2019	13:28:34	707	69.1	46.2	0
4/22/2019	13:29:34	702	69.1	46.1	0
4/22/2019	13:30:34	698	69	45.8	0
4/22/2019	13:31:34	697	68.9	45.4	0
4/22/2019	13:32:34	697	68.7	45.2	0
4/22/2019	13:33:34	695	68.6	45.3	0
4/22/2019	13:34:34	693	68.6	45.5	0
4/22/2019	13:35:34	691	68.6	45.8	0
4/22/2019	13:36:34	690	68.7	45.9	0
4/22/2019	13:37:34	689	68.7	45.8	0
4/22/2019	13:38:34	689	68.9	45.8	0
4/22/2019	13:39:34	687	69	45.8	0
4/22/2019	13:40:34	681	69.1	45.9	0
4/22/2019	13:41:34	679	69.1	45.9	0
4/22/2019	13:42:34	679	69.2	46.1	0
4/22/2019	13:43:34	672	69.3	46.3	0
4/22/2019	13:44:34	676	69.3	46	0
4/22/2019	13:45:34	681	69.2	45.7	0

4/22/2019	13:46:34	685	69.1	45.3	0
4/22/2019	13:47:34	688	68.9	45.2	0
4/22/2019	13:48:34	688	68.8	45.3	0
4/22/2019	13:49:34	686	68.8	45.6	0
4/22/2019	13:50:34	685	68.9	45.8	0
4/22/2019	13:51:34	685	68.9	45.8	0
4/22/2019	13:52:34	686	69	45.8	0
4/22/2019	13:53:34	686	69.1	45.7	0
4/22/2019	13:54:34	684	69.2	45.6	0
4/22/2019	13:55:34	683	69.4	45.5	0
4/22/2019	13:56:34	680	69.4	45.6	0
4/22/2019	13:57:34	685	69.5	45.5	0
4/22/2019	13:58:33	689	69.4	45.2	0
4/22/2019	13:59:33	693	69.3	44.8	0
4/22/2019	14:00:33	695	69	44.7	0
4/22/2019	14:01:33	698	69	44.8	0
4/22/2019	14:02:33	698	69	45	0
4/22/2019	14:03:33	697	69	45.2	0
4/22/2019	14:04:33	694	69	45.3	0
4/22/2019	14:05:33	693	69.2	45.3	0
4/22/2019	14:06:33	689	69.3	45.4	0
4/22/2019	14:07:33	682	69.4	45.5	0
4/22/2019	14:08:33	680	69.5	45.4	0
4/22/2019	14:09:33	675	69.6	45.4	0
4/22/2019	14:10:33	679	69.7	45.5	0
4/22/2019	14:11:33	690	69.7	45.5	0
4/22/2019	14:12:33	715	69.7	45.4	0
4/22/2019	14:13:33	750	69.7	45.2	0
4/22/2019	14:14:33	771	69.7	45.2	0
4/22/2019	14:15:33	779	69.7	45.1	0
4/22/2019	14:16:33	782	69.8	45.4	0
4/22/2019	14:17:33	800	69.8	45.7	0
4/22/2019	14:18:33	778	69.9	45.5	0
4/22/2019	14:19:33	766	69.9	45.5	0

4/22/2019	14:20:33	780	70	45.4	0
4/22/2019	14:21:33	785	70.1	45.3	0
4/22/2019	14:22:33	783	70.2	45.3	0
4/22/2019	14:23:33	768	70.2	45.4	0
4/22/2019	14:24:33	776	70.2	45.6	0
4/22/2019	14:25:33	778	70.2	45.2	0
4/22/2019	14:26:33	774	70.1	44.9	0
4/22/2019	14:27:33	772	69.9	44.8	0
4/22/2019	14:28:33	768	69.8	44.7	0
4/22/2019	14:29:33	767	69.7	44.6	0
4/22/2019	14:30:33	766	69.6	44.7	0
4/22/2019	14:31:33	764	69.6	45	0
4/22/2019	14:32:33	763	69.6	45.1	0
4/22/2019	14:33:33	762	69.7	45.2	0
4/22/2019	14:34:33	757	69.8	45.2	0
4/22/2019	14:35:33	753	69.9	45.3	0
4/22/2019	14:36:33	746	69.9	45.3	0
4/22/2019	14:37:33	743	69.9	44.8	0
4/22/2019	14:38:33	742	69.8	44.5	0
4/22/2019	14:39:33	742	69.6	44.2	0
4/22/2019	14:40:33	739	69.6	44	0
4/22/2019	14:41:33	741	69.4	43.8	0
4/22/2019	14:42:33	754	69.3	44.5	0
4/22/2019	14:43:33	774	69.4	45.1	0
4/22/2019	14:44:33	769	69.5	45	0
4/22/2019	14:45:33	771	69.6	44.9	0
4/22/2019	14:46:33	767	69.8	44.9	0
4/22/2019	14:47:33	763	69.9	44.8	0
4/22/2019	14:48:33	756	70	44.8	0
4/22/2019	14:49:33	747	70	44.8	0
4/22/2019	14:50:33	742	70	45	0
4/22/2019	14:51:33	766	70.1	45.5	0
4/22/2019	14:52:33	779	70	45.3	0
4/22/2019	14:53:33	773	69.9	44.8	0



4/22/2019	14:54:33	764	69.7	44.5	0
4/22/2019	14:55:33	761	69.7	44.5	0
4/22/2019	14:56:33	759	69.7	44.7	0
4/22/2019	14:57:33	759	69.8	44.8	0
4/22/2019	14:58:33	756	69.9	44.7	0
4/22/2019	14:59:33	753	70	44.7	0
4/22/2019	15:00:33	748	70.1	44.6	0
4/22/2019	15:01:33	750	70.2	44.5	0
4/22/2019	15:02:33	750	70.3	44.5	0
4/22/2019	15:03:33	749	70.4	44.5	0
4/22/2019	15:04:33	744	70.4	44.5	0
4/22/2019	15:05:33	736	70.5	44.4	0
4/22/2019	15:06:33	731	70.4	44.2	0
4/22/2019	15:07:33	730	70.3	44.1	0
4/22/2019	15:08:33	727	70.3	43.9	0
4/22/2019	15:09:33	722	70.2	43.8	0
4/22/2019	15:10:33	718	70.1	43.7	0
4/22/2019	15:11:33	715	70.1	43.8	0
4/22/2019	15:12:33	714	70.1	44	0
4/22/2019	15:13:33	713	70.1	44.1	0
4/22/2019	15:14:33	710	70.2	44.2	0
4/22/2019	15:15:33	706	70.3	44.2	0
4/22/2019	15:16:33	705	70.4	44.2	0
4/22/2019	15:17:33	699	70.4	43.6	0
4/22/2019	15:18:33	702	70.4	43.2	0
4/22/2019	15:19:33	703	70.2	42.9	0
4/22/2019	15:20:33	703	70	42.8	0
4/22/2019	15:21:33	702	69.8	42.6	0
4/22/2019	15:22:33	705	69.8	42.7	0
4/22/2019	15:23:33	704	69.8	43	0
4/22/2019	15:24:33	703	69.9	43.1	0
4/22/2019	15:25:33	701	70	43.1	0
4/22/2019	15:26:33	701	70.1	43.1	0
4/22/2019	15:27:33	699	70.2	43.1	0

4/22/2019	15:28:33	695	70.4	43.3	0
4/22/2019	15:29:33	686	70.5	42.9	0
4/22/2019	15:30:33	683	70.4	42.4	0
4/22/2019	15:31:33	682	70.3	42.3	0
4/22/2019	15:32:33	683	70.1	42.1	0
4/22/2019	15:33:33	682	69.9	42	0
4/22/2019	15:34:33	681	69.8	41.9	0
4/22/2019	15:35:33	680	69.7	42.2	0
4/22/2019	15:36:33	679	69.8	42.6	0
4/22/2019	15:37:33	676	69.9	42.7	0
4/22/2019	15:38:33	678	70	42.7	0
4/22/2019	15:39:33	677	70.1	42.7	0
4/22/2019	15:40:33	677	70.3	42.7	0
4/22/2019	15:41:33	677	70.4	42.7	0
4/22/2019	15:42:33	672	70.5	42.3	0
4/22/2019	15:43:33	668	70.5	42	0
4/22/2019	15:44:33	665	70.5	41.9	0
4/22/2019	15:45:33	664	70.4	41.9	0
4/22/2019	15:46:33	662	70.3	41.8	0
4/22/2019	15:47:33	659	70.2	41.8	0
4/22/2019	15:48:33	658	70.1	41.7	0
4/22/2019	15:49:33	656	70.1	41.9	0
4/22/2019	15:50:33	656	70.1	42.2	0
4/22/2019	15:51:33	656	70.2	42.2	0
4/22/2019	15:52:33	656	70.3	42.2	0
4/22/2019	15:53:33	657	70.4	42.1	0
4/22/2019	15:54:33	709	70.6	43	0
4/22/2019	15:55:33	686	70.6	42.1	0
4/22/2019	15:56:33	683	70.6	41.9	0
4/22/2019	15:57:33	680	70.5	41.9	0
4/22/2019	15:58:33	679	70.4	41.9	0
4/22/2019	15:59:33	679	70.3	42	0
4/22/2019	16:00:33	680	70.3	42	0
4/22/2019	16:01:33	680	70.3	42	0

4/22/2019	16:02:33	678	70.3	42.3	0
4/22/2019	16:03:33	675	70.3	42.5	0
4/22/2019	16:04:33	672	70.4	42.6	0
4/22/2019	16:05:33	666	70.6	42.7	0
4/22/2019	16:06:33	661	70.7	42.9	0
4/22/2019	16:07:33	656	70.9	43.1	0
4/22/2019	16:08:33	675	70.9	42.5	0
4/22/2019	16:09:33	701	70.9	42.1	0
4/22/2019	16:10:33	727	70.8	41.9	0
4/22/2019	16:11:33	754	70.7	41.7	0
4/22/2019	16:12:33	780	70.5	41.6	0
4/22/2019	16:13:33	808	70.2	41.5	0
4/22/2019	16:14:33	815	70.3	41.8	0
4/22/2019	16:15:33	814	70.4	42	0
4/22/2019	16:16:33	815	70.4	42.1	0
4/22/2019	16:17:33	813	70.6	42.1	0
4/22/2019	16:18:33	816	70.7	42	0
4/22/2019	16:19:33	810	70.9	41.9	0
4/22/2019	16:20:33	810	71	42	0
4/22/2019	16:21:33	818	71.1	41.9	0
4/22/2019	16:22:33	830	71	42	0
4/22/2019	16:23:33	846	71	42	0
4/22/2019	16:24:33	860	70.9	41.9	0
4/22/2019	16:25:33	876	70.8	41.6	0
4/22/2019	16:26:33	890	70.6	41.5	0
4/22/2019	16:27:33	904	70.6	41.4	0
4/22/2019	16:28:33	905	70.5	41.6	0
4/22/2019	16:29:33	902	70.5	41.9	0
4/22/2019	16:30:33	903	70.7	41.9	0
4/22/2019	16:31:33	901	70.8	41.8	0
4/22/2019	16:32:33	901	70.9	41.8	0
4/22/2019	16:33:33	898	71	41.8	0
4/22/2019	16:34:33	897	71.1	41.6	0
4/22/2019	16:35:33	896	71.1	41.3	0

4/22/2019	16:36:33	898	71.1	41.3	0.1
4/22/2019	16:37:33	900	71	41.2	0.2
4/22/2019	16:38:33	899	71	41.2	0.3
4/22/2019	16:39:33	899	70.9	41.2	0.3
4/22/2019	16:40:33	899	70.8	41.2	0.3
4/22/2019	16:41:33	896	70.8	41.2	0.4
4/22/2019	16:42:33	890	70.8	41.5	0.3
4/22/2019	16:43:33	890	70.8	41.6	0.3
4/22/2019	16:44:33	888	70.9	41.7	0.2
4/22/2019	16:45:33	882	71	41.8	0.4
4/22/2019	16:46:33	877	71.1	42	0.3
4/22/2019	16:47:33	869	71.2	41.9	0.3
4/22/2019	16:48:33	873	71.2	41.5	0.5
4/22/2019	16:49:33	879	71.2	41.2	0.5
4/22/2019	16:50:33	889	71.1	41.1	0.7
4/22/2019	16:51:33	896	70.9	40.9	0.7
4/22/2019	16:52:33	906	70.8	40.9	0.7
4/22/2019	16:53:33	915	70.7	41	0.6
4/22/2019	16:54:33	912	70.7	41.3	0.7
4/22/2019	16:55:33	907	70.8	41.4	0.6
4/22/2019	16:56:33	901	70.9	41.5	0.5
4/22/2019	16:57:33	896	71	41.7	0.4
4/22/2019	16:58:33	889	71.2	41.8	0.4
4/22/2019	16:59:33	878	71.3	41.6	0.5
4/22/2019	17:00:33	871	71.4	41.4	0.5
4/22/2019	17:01:33	879	71.3	41.3	0.6
4/22/2019	17:02:33	895	71.2	41.1	0.6
4/22/2019	17:03:33	909	71.1	40.9	0.7
4/22/2019	17:04:33	920	70.9	40.6	0.8
4/22/2019	17:05:33	931	70.8	40.6	0.8
4/22/2019	17:06:33	932	70.6	40.8	0.8
4/22/2019	17:07:33	931	70.7	41.1	0.8
4/22/2019	17:08:33	930	70.8	41.1	0.8
4/22/2019	17:09:33	930	71	41	0.8

4/22/2019	17:10:33	928	71.1	41	0.8
4/22/2019	17:11:33	927	71.2	40.9	0.8
4/22/2019	17:12:33	922	71.4	40.9	0.8
4/22/2019	17:13:33	918	71.3	40.8	0.8
4/22/2019	17:14:33	919	71.3	40.8	0.8
4/22/2019	17:15:33	925	71.2	40.7	0.8
4/22/2019	17:16:33	927	71.2	40.7	0.8
4/22/2019	17:17:33	928	71.1	40.6	0.8
4/22/2019	17:18:33	934	71	40.6	0.9
4/22/2019	17:19:33	940	70.7	40.4	0.9
4/22/2019	17:20:33	939	70.7	40.6	0.9
4/22/2019	17:21:33	941	70.8	40.8	0.9
4/22/2019	17:22:33	940	70.9	40.9	0.9
4/22/2019	17:23:33	937	71.1	40.9	0.9
4/22/2019	17:24:33	934	71.2	40.8	0.9
4/22/2019	17:25:33	934	71.3	40.7	0.9
4/22/2019	17:26:33	934	71.4	40.4	0.9
4/22/2019	17:27:33	937	71.4	40.3	0.9
4/22/2019	17:28:33	941	71.4	40.3	0.9
4/22/2019	17:29:33	945	71.3	40.3	1
4/22/2019	17:30:33	946	71.3	40.2	0.9
4/22/2019	17:31:33	948	71.2	40.1	0.9
4/22/2019	17:32:33	952	71.1	40.2	1
4/22/2019	17:33:33	954	71	40.2	0.9
4/22/2019	17:34:33	948	71.1	40.5	0.9
4/22/2019	17:35:33	944	71.2	40.6	0.9
4/22/2019	17:36:33	943	71.3	40.6	0.9
4/22/2019	17:37:33	940	71.4	40.6	0.9
4/22/2019	17:38:33	933	71.5	40.7	0.9
4/22/2019	17:39:33	933	71.7	40.7	0.9
4/22/2019	17:40:33	923	71.7	40.7	0.9
4/22/2019	17:41:33	923	71.7	40.5	0.9
4/22/2019	17:42:33	926	71.6	40.3	0.9
4/22/2019	17:43:33	930	71.5	40.2	0.9



4/22/2019	17:44:33	933	71.4	40.1	0.9
4/22/2019	17:45:33	933	71.2	40.1	0.8
4/22/2019	17:46:33	937	71.1	40.2	0.8
4/22/2019	17:47:33	934	71.1	40.4	0.8
4/22/2019	17:48:33	927	71.2	40.6	0.8
4/22/2019	17:49:33	925	71.3	40.6	0.9
4/22/2019	17:50:33	920	71.5	40.6	0.8
4/22/2019	17:51:33	916	71.6	40.6	0.8
4/22/2019	17:52:33	907	71.7	40.4	0.8
4/22/2019	17:53:33	889	71.7	40.3	0.8
4/22/2019	17:54:33	886	71.7	40.1	0.8
4/22/2019	17:55:33	893	71.6	40	0.8
4/22/2019	17:56:33	899	71.3	39.7	0.8
4/22/2019	17:57:33	904	71.2	39.6	0.8
4/22/2019	17:58:33	909	71	39.6	0.8
4/22/2019	17:59:33	911	71	39.8	0.7
4/22/2019	18:00:33	908	71	40.1	0.8
4/22/2019	18:01:33	909	71.1	40.2	0.8
4/22/2019	18:02:33	906	71.3	40.2	0.7
4/22/2019	18:03:33	901	71.4	40.2	0.8
4/22/2019	18:04:33	884	71.6	40.3	0.7
4/22/2019	18:05:33	863	71.7	40.4	0.6
4/22/2019	18:06:33	845	71.7	40.5	0.6
4/22/2019	18:07:33	845	71.7	40.5	0.5
4/22/2019	18:08:33	853	71.6	40.2	0.5
4/22/2019	18:09:33	859	71.4	40	0.6
4/22/2019	18:10:33	865	71.2	39.8	0.5
4/22/2019	18:11:33	867	71	39.7	0.6
4/22/2019	18:12:33	867	71	40	0.5
4/22/2019	18:13:33	864	71	40.3	0.5
4/22/2019	18:14:33	864	71.1	40.4	0.5
4/22/2019	18:15:33	864	71.3	40.4	0.5
4/22/2019	18:16:33	864	71.4	40.4	0.4
4/22/2019	18:17:33	864	71.6	40.2	0.5

4/22/2019	18:18:33	862	71.7	40.1	0.4
4/22/2019	18:19:33	861	71.6	39.7	0.4
4/22/2019	18:20:33	863	71.6	39.6	0.4
4/22/2019	18:21:33	866	71.5	39.6	0.5
4/22/2019	18:22:33	869	71.4	39.5	0.5
4/22/2019	18:23:33	875	71.3	39.5	0.5
4/22/2019	18:24:33	877	71.2	39.5	0.5
4/22/2019	18:25:33	878	71.2	39.5	0.5
4/22/2019	18:26:33	876	71.2	39.7	0.5
4/22/2019	18:27:33	874	71.3	39.7	0.3
4/22/2019	18:28:33	874	71.4	39.7	0.5
4/22/2019	18:29:33	874	71.6	39.7	0.5
4/22/2019	18:30:33	870	71.7	39.7	0.4
4/22/2019	18:31:33	870	71.7	39.3	0.4
4/22/2019	18:32:33	876	71.7	38.9	0.5
4/22/2019	18:33:33	880	71.6	38.8	0.3
4/22/2019	18:34:33	883	71.5	38.8	0.4
4/22/2019	18:35:33	884	71.3	38.8	0.4
4/22/2019	18:36:33	885	71.2	38.9	0.4
4/22/2019	18:37:33	886	71.1	39.1	0.4
4/22/2019	18:38:33	885	71.1	39.4	0.3
4/22/2019	18:39:33	880	71.2	39.4	0.3
4/22/2019	18:40:33	879	71.4	39.5	0.4
4/22/2019	18:41:33	875	71.5	39.5	0.3
4/22/2019	18:42:33	869	71.7	39.3	0.3
4/22/2019	18:43:33	857	71.8	39.1	0.2
4/22/2019	18:44:33	857	71.8	39.1	0.2
4/22/2019	18:45:33	866	71.6	39.1	0.3
4/22/2019	18:46:33	879	71.5	38.9	0.3
4/22/2019	18:47:33	891	71.2	38.8	0.3
4/22/2019	18:48:33	905	70.9	38.8	0.3
4/22/2019	18:49:33	913	70.9	39	0.2
4/22/2019	18:50:33	914	71	39.3	0.2
4/22/2019	18:51:33	915	71.1	39.4	0.3

4/22/2019	18:52:33	915	71.2	39.3	0.2
4/22/2019	18:53:33	916	71.4	39.3	0.2
4/22/2019	18:54:33	914	71.6	39.2	0.2
4/22/2019	18:55:33	914	71.7	39.2	0.3
4/22/2019	18:56:33	914	71.8	39	0.3
4/22/2019	18:57:33	917	71.7	39.1	0.3
4/22/2019	18:58:33	928	71.7	39.1	0.3
4/22/2019	18:59:33	937	71.6	39	0.4
4/22/2019	19:00:33	949	71.5	38.9	0.4
4/22/2019	19:01:33	960	71.3	38.8	0.3
4/22/2019	19:02:33	964	71.2	38.9	0.4
4/22/2019	19:03:33	964	71.2	39.1	0.3
4/22/2019	19:04:33	964	71.2	39.3	0.3
4/22/2019	19:05:33	966	71.4	39.3	0.3
4/22/2019	19:06:33	967	71.5	39.2	0.2
4/22/2019	19:07:33	966	71.7	39.2	0.3
4/22/2019	19:08:33	965	71.8	39.1	0.3
4/22/2019	19:09:33	965	71.9	39.1	0.3
4/22/2019	19:10:33	967	72	39	0.4
4/22/2019	19:11:33	973	72.1	39.1	0.3
4/22/2019	19:12:33	986	72.1	39.1	0.4
4/22/2019	19:13:33	996	72	39.1	0.4
4/22/2019	19:14:33	1006	71.9	39.1	0.4
4/22/2019	19:15:33	1011	71.7	39.1	0.5
4/22/2019	19:16:33	1016	71.6	39.1	0.4
4/22/2019	19:17:33	1024	71.4	39.1	0.5
4/22/2019	19:18:33	1025	71.4	39.2	0.4
4/22/2019	19:19:33	1025	71.4	39.5	0.3
4/22/2019	19:20:33	1023	71.5	39.6	0.3
4/22/2019	19:21:33	1023	71.6	39.6	0.3
4/22/2019	19:22:33	1023	71.7	39.6	0.3
4/22/2019	19:23:33	1019	71.8	39.7	0.4
4/22/2019	19:24:33	1018	71.8	39.4	0.4
4/22/2019	19:25:33	1019	71.6	39.2	0.4

4/22/2019	19:26:33	1020	71.4	39.1	0.4
4/22/2019	19:27:33	1020	71.2	39	0.5
4/22/2019	19:28:33	1020	71.1	39	0.3
4/22/2019	19:29:33	1020	70.9	39.1	0.4
4/22/2019	19:30:33	1019	70.9	39.2	0.4
4/22/2019	19:31:33	1016	71	39.5	0.5
4/22/2019	19:32:33	1009	71.2	39.7	0.3
4/22/2019	19:33:33	1000	71.3	39.8	0.3
4/22/2019	19:34:33	966	71.5	40.4	0.2
4/22/2019	19:35:33	948	71.6	40.4	0.1
4/22/2019	19:36:33	924	71.7	40	0.1
4/22/2019	19:37:33	913	71.7	39.6	0.2
4/22/2019	19:38:33	910	71.6	39.5	0.2
4/22/2019	19:39:33	911	71.4	39.2	0.2
4/22/2019	19:40:33	908	71.2	39	0.3
4/22/2019	19:41:33	907	71	38.9	0.2
4/22/2019	19:42:33	903	70.9	39.2	0.2
4/22/2019	19:43:33	906	71	39.4	0.2
4/22/2019	19:44:33	907	71.1	39.4	0.1
4/22/2019	19:45:33	904	71.2	39.3	0.3
4/22/2019	19:46:33	903	71.4	39.2	0.2
4/22/2019	19:47:33	901	71.5	39.2	0.2
4/22/2019	19:48:33	900	71.6	39.2	0.2
4/22/2019	19:49:33	897	71.7	38.7	0.2
4/22/2019	19:50:33	892	71.6	38.7	0.3
4/22/2019	19:51:33	890	71.5	38.6	0.3
4/22/2019	19:52:33	895	71.4	38.6	0.4
4/22/2019	19:53:33	895	71.3	38.5	0.4
4/22/2019	19:54:33	893	71.2	38.4	0.5
4/22/2019	19:55:32	894	71	38.5	0.4
4/22/2019	19:56:32	895	71.1	38.8	0.3
4/22/2019	19:57:32	893	71.2	38.8	0.3
4/22/2019	19:58:32	892	71.3	38.8	0.3
4/22/2019	19:59:32	891	71.5	38.8	0.4

4/22/2019	20:00:32	892	71.6	38.8	0.4
4/22/2019	20:01:32	888	71.7	38.8	0.4
4/22/2019	20:02:32	889	71.7	38.8	0.4
4/22/2019	20:03:32	887	71.8	38.8	0.5
4/22/2019	20:04:32	882	71.8	38.5	0.5
4/22/2019	20:05:32	879	71.7	38.4	0.5
4/22/2019	20:06:32	876	71.5	38.3	0.5
4/22/2019	20:07:32	871	71.3	38.4	0.5
4/22/2019	20:08:32	868	71.1	38.4	0.6
4/22/2019	20:09:32	865	71.1	38.7	0.5
4/22/2019	20:10:32	865	71.2	38.9	0.4
4/22/2019	20:11:32	863	71.3	39	0.3
4/22/2019	20:12:32	859	71.4	39	0.4
4/22/2019	20:13:32	856	71.6	39.1	0.3
4/22/2019	20:14:32	846	71.7	39.3	0.3
4/22/2019	20:15:32	840	71.8	39.3	0.3
4/22/2019	20:16:32	840	71.8	39.2	0.4
4/22/2019	20:17:32	831	71.9	39	0.4
4/22/2019	20:18:32	825	71.7	38.7	0.5
4/22/2019	20:19:32	823	71.4	38.5	0.5
4/22/2019	20:20:32	824	71.1	38.4	0.6
4/22/2019	20:21:32	823	71	38.5	0.5
4/22/2019	20:22:32	823	71	38.8	0.5
4/22/2019	20:23:32	822	71.1	38.9	0.4
4/22/2019	20:24:32	821	71.2	38.9	0.4
4/22/2019	20:25:32	822	71.3	38.9	0.5
4/22/2019	20:26:32	819	71.4	38.9	0.6
4/22/2019	20:27:32	817	71.5	38.9	0.5
4/22/2019	20:28:32	800	71.6	39.6	0.3
4/22/2019	20:29:32	806	71.7	39	0.3
4/22/2019	20:30:32	826	71.6	38.9	0.5
4/22/2019	20:31:32	837	71.5	38.9	0.5
4/22/2019	20:32:32	856	71.4	38.8	0.4
4/22/2019	20:33:32	877	71.2	38.6	0.6



4/22/2019	20:34:32	896	71	38.6	0.5
4/22/2019	20:35:32	902	70.9	38.9	0.5
4/22/2019	20:36:32	904	71	39	0.5
4/22/2019	20:37:32	907	71.1	39	0.4
4/22/2019	20:38:32	910	71.2	39	0.4
4/22/2019	20:39:32	915	71.3	39	0.4
4/22/2019	20:40:32	922	71.4	39.1	0.4
4/22/2019	20:41:32	938	71.5	39.1	0.5
4/22/2019	20:42:32	940	71.6	39.1	0.4
4/22/2019	20:43:32	952	71.6	39.2	0.6
4/22/2019	20:44:32	969	71.6	38.9	0.6
4/22/2019	20:45:32	989	71.4	38.8	0.6
4/22/2019	20:46:32	1003	71.3	38.8	0.6
4/22/2019	20:47:32	1015	71.1	38.8	0.7
4/22/2019	20:48:32	1023	71	39	0.7
4/22/2019	20:49:32	1017	71.1	39.3	0.6
4/22/2019	20:50:32	1007	71.2	39.5	0.5
4/22/2019	20:51:32	989	71.3	39.8	0.4
4/22/2019	20:52:32	982	71.5	39.7	0.4
4/22/2019	20:53:32	977	71.6	39.9	0.5
4/22/2019	20:54:32	951	71.7	40.2	0.4
4/22/2019	20:55:32	962	71.8	39.9	0.4
4/22/2019	20:56:32	979	71.8	39.8	0.4
4/22/2019	20:57:32	985	71.7	39.5	0.5
4/22/2019	20:58:32	997	71.5	39.2	0.6
4/22/2019	20:59:32	1007	71.4	39.1	0.5
4/22/2019	21:00:32	1015	71.1	39	0.6
4/22/2019	21:01:32	1018	71	39.2	0.5
4/22/2019	21:02:32	1016	71.1	39.4	0.5
4/22/2019	21:03:32	1018	71.1	39.4	0.5
4/22/2019	21:04:32	1019	71.3	39.4	0.5
4/22/2019	21:05:32	1021	71.4	39.4	0.5
4/22/2019	21:06:32	1023	71.4	39.4	0.5
4/22/2019	21:07:32	1024	71.5	39.4	0.5

4/22/2019	21:08:32	1026	71.6	39.4	0.4
4/22/2019	21:09:32	1025	71.7	39.3	0.6
4/22/2019	21:10:32	1028	71.6	39.2	0.5
4/22/2019	21:11:32	1030	71.4	39.1	0.6
4/22/2019	21:12:32	1033	71.3	39	0.6
4/22/2019	21:13:32	1038	71.2	39	0.6
4/22/2019	21:14:32	1040	71	39	0.6
4/22/2019	21:15:32	1040	71	39.2	0.5
4/22/2019	21:16:32	1041	71.1	39.3	0.5
4/22/2019	21:17:32	1040	71.2	39.3	0.5
4/22/2019	21:18:32	1038	71.3	39.3	0.5
4/22/2019	21:19:32	1038	71.4	39.3	0.5
4/22/2019	21:20:32	1038	71.5	39.3	0.5
4/22/2019	21:21:32	1035	71.6	39.3	0.4
4/22/2019	21:22:32	1036	71.7	39.3	0.5
4/22/2019	21:23:32	1035	71.7	39.2	0.5
4/22/2019	21:24:32	1036	71.7	39	0.6
4/22/2019	21:25:32	1036	71.5	38.7	0.7
4/22/2019	21:26:32	1036	71.3	38.6	0.6
4/22/2019	21:27:32	1035	71.1	38.6	0.6
4/22/2019	21:28:32	1036	71	38.8	0.6
4/22/2019	21:29:32	1030	71.1	39.2	0.5
4/22/2019	21:30:32	996	71.1	40.2	0.3
4/22/2019	21:31:32	957	71.3	41	0.1
4/22/2019	21:32:32	936	71.4	40.9	0.2
4/22/2019	21:33:32	948	71.5	40.5	0.3
4/22/2019	21:34:32	959	71.6	40.6	0.2
4/22/2019	21:35:32	942	71.7	40.9	0.1
4/22/2019	21:36:32	947	71.7	40.5	0.3
4/22/2019	21:37:32	948	71.7	40	0.4
4/22/2019	21:38:32	954	71.5	39.6	0.4
4/22/2019	21:39:32	960	71.3	39.3	0.4
4/22/2019	21:40:32	962	71	39.1	0.4
4/22/2019	21:41:32	964	70.9	39.3	0.4

4/22/2019	21:42:32	962	70.9	39.6	0.3
4/22/2019	21:43:32	960	71	39.7	0.3
4/22/2019	21:44:32	960	71.1	39.7	0.3
4/22/2019	21:45:32	961	71.2	39.5	0.3
4/22/2019	21:46:32	964	71.3	39.5	0.4
4/22/2019	21:47:32	964	71.4	39.5	0.4
4/22/2019	21:48:32	965	71.5	39.5	0.4
4/22/2019	21:49:32	963	71.6	39.4	0.4
4/22/2019	21:50:32	964	71.6	39.1	0.4
4/22/2019	21:51:32	962	71.5	39	0.5
4/22/2019	21:52:32	965	71.3	39	0.5
4/22/2019	21:53:32	970	71.1	38.9	0.5
4/22/2019	21:54:32	970	71	39	0.5
4/22/2019	21:55:32	971	71	39.1	0.4
4/22/2019	21:56:32	972	71.1	39.3	0.4
4/22/2019	21:57:32	969	71.2	39.3	0.4
4/22/2019	21:58:32	970	71.3	39.3	0.4
4/22/2019	21:59:32	969	71.4	39.2	0.4
4/22/2019	22:00:32	966	71.5	39.2	0.4
4/22/2019	22:01:32	967	71.6	39.2	0.4
4/22/2019	22:02:32	968	71.7	39.3	0.4
4/22/2019	22:03:32	975	71.7	39.4	0.4
4/22/2019	22:04:32	991	71.6	39.3	0.6
4/22/2019	22:05:32	1008	71.3	39.1	0.7
4/22/2019	22:06:32	1021	71.2	39.1	0.8
4/22/2019	22:07:32	1037	70.9	39.1	0.8
4/22/2019	22:08:32	1050	70.8	39.2	0.8
4/22/2019	22:09:32	1054	70.7	39.5	0.8
4/22/2019	22:10:32	1053	70.7	39.7	0.8
4/22/2019	22:11:32	1050	70.9	39.8	0.8
4/22/2019	22:12:32	1038	71	40	0.8
4/22/2019	22:13:32	1002	71.2	40.7	0.6
4/22/2019	22:14:32	993	71.3	40.7	0.7
4/22/2019	22:15:32	990	71.4	40.6	0.7

4/22/2019	22:16:32	1001	71.5	40.4	0.8
4/22/2019	22:17:32	1008	71.6	40.5	0.7
4/22/2019	22:18:32	1015	71.7	40.5	0.7
4/22/2019	22:19:32	1003	71.7	40.4	0.8
4/22/2019	22:20:32	1001	71.5	40.1	0.7
4/22/2019	22:21:32	1009	71.4	39.8	0.8
4/22/2019	22:22:32	1013	71.1	39.6	0.8
4/22/2019	22:23:32	1015	71	39.7	0.8
4/22/2019	22:24:32	1015	71	40	0.8
4/22/2019	22:25:32	1015	71	40.1	0.8
4/22/2019	22:26:32	1015	71.1	40.1	0.8
4/22/2019	22:27:32	1014	71.3	40	0.8
4/22/2019	22:28:32	1015	71.4	40	0.8
4/22/2019	22:29:32	1015	71.5	39.9	0.8
4/22/2019	22:30:32	1015	71.5	40	0.8
4/22/2019	22:31:32	1016	71.6	39.9	0.8
4/22/2019	22:32:32	1013	71.6	39.3	0.8
4/22/2019	22:33:32	1011	71.4	39.2	0.8
4/22/2019	22:34:32	1010	71.2	39.2	0.8
4/22/2019	22:35:32	1008	71.1	39.1	0.8
4/22/2019	22:36:32	1006	71	39.3	0.8
4/22/2019	22:37:32	1004	71	39.5	0.8
4/22/2019	22:38:32	1002	71.1	39.7	0.8
4/22/2019	22:39:32	996	71.2	39.7	0.8
4/22/2019	22:40:32	989	71.4	39.8	0.7
4/22/2019	22:41:32	987	71.5	39.7	0.8
4/22/2019	22:42:32	981	71.6	39.8	0.8
4/22/2019	22:43:32	980	71.6	39.8	0.8
4/22/2019	22:44:32	979	71.7	39.8	0.8
4/22/2019	22:45:32	976	71.7	39.9	0.8
4/22/2019	22:46:32	970	71.8	39.9	0.8
4/22/2019	22:47:32	964	71.7	39.6	0.8
4/22/2019	22:48:32	956	71.5	39.3	0.7
4/22/2019	22:49:32	950	71.3	39	0.8

4/22/2019	22:50:32	947	71	39	0.8
4/22/2019	22:51:32	946	71	39.4	0.8
4/22/2019	22:52:32	944	71.1	39.5	0.8
4/22/2019	22:53:32	945	71.1	39.5	0.8
4/22/2019	22:54:32	942	71.3	39.5	0.7
4/22/2019	22:55:32	939	71.4	39.5	0.7
4/22/2019	22:56:32	938	71.5	39.5	0.7
4/22/2019	22:57:32	932	71.5	39.5	0.7
4/22/2019	22:58:32	929	71.6	39.6	0.7
4/22/2019	22:59:32	930	71.6	39.6	0.8
4/22/2019	23:00:32	923	71.6	39.1	0.7
4/22/2019	23:01:32	914	71.5	39	0.7
4/22/2019	23:02:32	907	71.3	39	0.7
4/22/2019	23:03:32	906	71.1	38.9	0.7
4/22/2019	23:04:32	905	71	39.2	0.7
4/22/2019	23:05:32	907	71.1	39.4	0.6
4/22/2019	23:06:32	907	71.1	39.4	0.7
4/22/2019	23:07:32	904	71.3	39.4	0.7
4/22/2019	23:08:32	904	71.4	39.4	0.7
4/22/2019	23:09:32	903	71.5	39.4	0.6
4/22/2019	23:10:32	904	71.6	39.4	0.6
4/22/2019	23:11:32	899	71.6	39.4	0.6
4/22/2019	23:12:32	897	71.7	39.4	0.7
4/22/2019	23:13:32	897	71.5	38.6	0.6
4/22/2019	23:14:32	898	71.3	38.4	0.7
4/22/2019	23:15:32	895	71.1	38.3	0.7
4/22/2019	23:16:32	894	70.9	38.4	0.7
4/22/2019	23:17:32	895	70.8	38.8	0.7
4/22/2019	23:18:32	895	70.9	38.9	0.7
4/22/2019	23:19:32	894	71	39	0.5
4/22/2019	23:20:32	890	71.1	39	0.6
4/22/2019	23:21:32	888	71.2	39.1	0.6
4/22/2019	23:22:32	882	71.4	39.2	0.5
4/22/2019	23:23:32	864	71.5	39.4	0.5



4/22/2019	23:24:32	834	71.5	40.3	0.3
4/22/2019	23:25:32	806	71.6	40.7	0.2
4/22/2019	23:26:32	837	71.5	38.9	0.4
4/22/2019	23:27:32	836	71.2	38.8	0.4
4/22/2019	23:28:32	839	70.9	38.7	0.3
4/22/2019	23:29:32	839	70.8	39	0.4
4/22/2019	23:30:32	840	70.8	39.3	0.2
4/22/2019	23:31:32	840	70.9	39.4	0.4
4/22/2019	23:32:32	840	71	39.3	0.3
4/22/2019	23:33:32	841	71.1	39.3	0.3
4/22/2019	23:34:32	842	71.2	39.3	0.3
4/22/2019	23:35:32	842	71.3	39.3	0.2
4/22/2019	23:36:32	843	71.4	39.3	0.3
4/22/2019	23:37:32	844	71.4	39.4	0.4
4/22/2019	23:38:32	844	71.4	39.4	0.3
4/22/2019	23:39:32	848	71.5	39.5	0.3
4/22/2019	23:40:32	848	71.5	39.5	0.2
4/22/2019	23:41:32	847	71.5	39.3	0.4
4/22/2019	23:42:32	846	71.3	39	0.3
4/22/2019	23:43:32	850	71.1	38.7	0.4
4/22/2019	23:44:32	850	70.8	38.7	0.5
4/22/2019	23:45:32	850	70.7	39.2	0.2
4/22/2019	23:46:32	848	70.8	39.3	0.3
4/22/2019	23:47:32	842	70.9	39.5	0.2
4/22/2019	23:48:32	830	71	39.9	0.1
4/22/2019	23:49:32	803	71.1	40.6	0.1
4/22/2019	23:50:32	772	71.2	41.4	0.1
4/22/2019	23:51:32	762	71.3	41.5	0.1
4/22/2019	23:52:32	772	71.4	41.1	0
4/22/2019	23:53:32	782	71.3	40.6	0.1
4/22/2019	23:54:32	790	71.2	39.8	0.1
4/22/2019	23:55:32	793	70.8	39.3	0.3
4/22/2019	23:56:32	799	70.4	40.4	0.1
4/22/2019	23:57:32	800	70.3	41.9	0.2

4/22/2019	23:58:32	803	70.2	42.9	0.1
4/22/2019	23:59:32	804	70.2	43.1	0.2
4/23/2019	0:00:32	806	70.2	43	0.1
4/23/2019	0:01:32	803	70.4	42.8	0.1
4/23/2019	0:02:32	803	70.5	42.6	0.1
4/23/2019	0:03:32	798	70.7	42.5	0.1
4/23/2019	0:04:32	796	70.8	42.3	0.1
4/23/2019	0:05:32	791	70.9	42.2	0.1
4/23/2019	0:06:32	790	71	42.1	0.1
4/23/2019	0:07:32	792	71	41.6	0.1
4/23/2019	0:08:32	792	70.9	41.1	0.1
4/23/2019	0:09:32	795	70.5	40.7	0.1
4/23/2019	0:10:32	796	70.4	40.7	0.2
4/23/2019	0:11:32	797	70.4	41	0.1
4/23/2019	0:12:32	795	70.4	41.1	0.1
4/23/2019	0:13:32	794	70.5	41.1	0.1
4/23/2019	0:14:32	787	70.6	41.3	0
4/23/2019	0:15:32	782	70.8	41.5	0.1
4/23/2019	0:16:32	773	70.9	41.6	0
4/23/2019	0:17:32	736	71	42.4	0
4/23/2019	0:18:32	710	71.1	43	0
4/23/2019	0:19:32	699	71.2	43.1	0
4/23/2019	0:20:32	704	71.2	42.9	0
4/23/2019	0:21:32	713	71.1	41.9	0
4/23/2019	0:22:32	715	70.7	41.1	0
4/23/2019	0:23:32	721	70.5	41	0
4/23/2019	0:24:32	723	70.4	41.3	0
4/23/2019	0:25:32	724	70.4	41.5	0
4/23/2019	0:26:32	723	70.5	41.6	0
4/23/2019	0:27:32	721	70.6	41.5	0
4/23/2019	0:28:32	722	70.7	41.4	0
4/23/2019	0:29:32	721	70.8	41.5	0
4/23/2019	0:30:32	720	70.9	41.4	0
4/23/2019	0:31:32	717	71	41.4	0

4/23/2019	0:32:32	712	71.1	41.5	0
4/23/2019	0:33:32	715	71.1	41.4	0
4/23/2019	0:34:32	718	71.2	41.4	0
4/23/2019	0:35:32	718	71.2	41.3	0
4/23/2019	0:36:32	721	71.1	41	0
4/23/2019	0:37:32	725	70.8	40.3	0.1
4/23/2019	0:38:32	725	70.4	40.2	0.1
4/23/2019	0:39:32	726	69.9	41.6	0.1
4/23/2019	0:40:32	728	69.9	43.3	0
4/23/2019	0:41:32	732	70	43.8	0
4/23/2019	0:42:32	731	70	43.5	0.1
4/23/2019	0:43:32	733	70.2	43.3	0
4/23/2019	0:44:32	733	70.3	43.3	0
4/23/2019	0:45:32	733	70.4	43.3	0
4/23/2019	0:46:32	733	70.6	43.1	0
4/23/2019	0:47:32	727	70.7	43	0
4/23/2019	0:48:32	719	70.8	43	0
4/23/2019	0:49:32	722	70.8	42.9	0
4/23/2019	0:50:32	724	70.8	42.3	0
4/23/2019	0:51:32	729	70.7	41.6	0
4/23/2019	0:52:32	729	70.5	41.3	0
4/23/2019	0:53:32	728	70.3	41.1	0.1
4/23/2019	0:54:32	729	70.3	41.4	0
4/23/2019	0:55:32	729	70.4	41.6	0
4/23/2019	0:56:32	727	70.4	41.6	0
4/23/2019	0:57:32	727	70.5	41.6	0
4/23/2019	0:58:32	729	70.6	41.6	0.1
4/23/2019	0:59:32	729	70.7	41.6	0
4/23/2019	1:00:32	730	70.8	41.5	0
4/23/2019	1:01:32	731	70.9	41.5	0
4/23/2019	1:02:32	732	71	41.5	0
4/23/2019	1:03:32	734	70.8	40.8	0
4/23/2019	1:04:32	735	70.5	40.4	0.1
4/23/2019	1:05:32	734	70.3	40.3	0.1

4/23/2019	1:06:32	737	70.1	40.4	0.1
4/23/2019	1:07:32	735	70.1	40.8	0.1
4/23/2019	1:08:32	736	70.2	40.9	0.1
4/23/2019	1:09:32	734	70.3	41	0
4/23/2019	1:10:32	732	70.4	41	0
4/23/2019	1:11:32	729	70.5	41	0
4/23/2019	1:12:32	726	70.6	41.1	0.1
4/23/2019	1:13:32	725	70.7	41.1	0.1
4/23/2019	1:14:32	723	70.7	41.2	0
4/23/2019	1:15:32	725	70.8	41.1	0.1
4/23/2019	1:16:32	727	70.6	40.6	0.1
4/23/2019	1:17:32	729	70.3	40	0.1
4/23/2019	1:18:32	727	70	40.1	0.1
4/23/2019	1:19:32	728	69.2	42	0.1
4/23/2019	1:20:32	729	69.3	43.5	0.1
4/23/2019	1:21:32	729	69.5	43.8	0.1
4/23/2019	1:22:32	730	69.6	43.5	0
4/23/2019	1:23:32	730	69.8	43.3	0.1
4/23/2019	1:24:32	731	69.9	43.2	0.1
4/23/2019	1:25:32	729	70	43	0
4/23/2019	1:26:32	730	70.1	42.9	0.1
4/23/2019	1:27:32	731	70.3	42.9	0.1
4/23/2019	1:28:32	730	70.4	42.8	0.1
4/23/2019	1:29:32	731	70.4	42.9	0
4/23/2019	1:30:32	730	70.5	42.6	0
4/23/2019	1:31:32	731	70.4	41.7	0.1
4/23/2019	1:32:32	729	70.2	41.4	0.1
4/23/2019	1:33:32	729	70.1	41.2	0.1
4/23/2019	1:34:32	729	70	41.4	0.1
4/23/2019	1:35:32	728	70	41.6	0.1
4/23/2019	1:36:32	725	70.1	41.8	0
4/23/2019	1:37:32	726	70.1	41.7	0
4/23/2019	1:38:32	725	70.3	41.7	0.1
4/23/2019	1:39:32	722	70.3	41.7	0.1

4/23/2019	1:40:32	726	70.4	41.7	0.1
4/23/2019	1:41:32	725	70.5	41.7	0.1
4/23/2019	1:42:32	724	70.5	41.7	0.1
4/23/2019	1:43:32	723	70.5	41.6	0
4/23/2019	1:44:32	728	70.4	40.9	0.1
4/23/2019	1:45:32	726	70	40.3	0.2
4/23/2019	1:46:32	725	69.7	40.7	0.1
4/23/2019	1:47:32	724	69.6	41.2	0.1
4/23/2019	1:48:32	726	69.7	41.4	0.1
4/23/2019	1:49:32	726	69.8	41.4	0.1
4/23/2019	1:50:32	727	69.8	41.4	0.1
4/23/2019	1:51:32	728	69.9	41.4	0.1
4/23/2019	1:52:31	727	70	41.4	0.1
4/23/2019	1:53:31	728	70.1	41.4	0.1
4/23/2019	1:54:31	728	70.2	41.3	0
4/23/2019	1:55:31	725	70.3	41.3	0.1
4/23/2019	1:56:31	726	70.3	41.3	0
4/23/2019	1:57:31	730	70.2	41.4	0.1
4/23/2019	1:58:31	728	70.1	40.6	0.2
4/23/2019	1:59:31	728	69.8	40.3	0.1
4/23/2019	2:00:31	726	69.6	41	0.1
4/23/2019	2:01:31	729	69.6	41.2	0.1
4/23/2019	2:02:31	730	69.6	41.3	0.1
4/23/2019	2:03:31	730	69.7	41.3	0.1
4/23/2019	2:04:31	729	69.8	41.4	0.1
4/23/2019	2:05:31	730	69.9	41.3	0
4/23/2019	2:06:31	730	70	41.3	0.1
4/23/2019	2:07:31	731	70	41.3	0.1
4/23/2019	2:08:31	729	70.1	41.3	0.1
4/23/2019	2:09:31	729	70.2	41.3	0.1
4/23/2019	2:10:31	730	70.2	41.3	0.1
4/23/2019	2:11:31	731	70.1	41.1	0.2
4/23/2019	2:12:31	734	70	40.5	0.2
4/23/2019	2:13:31	733	69.7	40.4	0.1



4/23/2019	2:14:31	734	69.6	41	0.2
4/23/2019	2:15:31	735	69.6	41.2	0.2
4/23/2019	2:16:31	735	69.6	41.3	0.1
4/23/2019	2:17:31	735	69.6	41.4	0.2
4/23/2019	2:18:31	734	69.7	41.3	0
4/23/2019	2:19:31	735	69.8	41.4	0.2
4/23/2019	2:20:31	736	69.9	41.4	0.1
4/23/2019	2:21:31	735	69.9	41.3	0.1
4/23/2019	2:22:31	738	70	41.4	0.1
4/23/2019	2:23:31	740	70.1	41.4	0.1
4/23/2019	2:24:31	742	70.1	41.4	0.2
4/23/2019	2:25:31	743	70.1	41.5	0.2
4/23/2019	2:26:31	743	69.8	40.8	0.2
4/23/2019	2:27:31	742	69.7	40.5	0.1
4/23/2019	2:28:31	741	69.5	41.1	0.1
4/23/2019	2:29:31	741	69.5	41.4	0.1
4/23/2019	2:30:31	742	69.5	41.4	0.1
4/23/2019	2:31:31	743	69.6	41.4	0.1
4/23/2019	2:32:31	741	69.6	41.4	0.1
4/23/2019	2:33:31	741	69.7	41.4	0.1
4/23/2019	2:34:31	744	69.8	41.4	0.1
4/23/2019	2:35:31	742	69.9	41.4	0.1
4/23/2019	2:36:31	741	69.9	41.4	0.1
4/23/2019	2:37:31	743	70	41.4	0.1
4/23/2019	2:38:31	741	70.1	41.4	0.1
4/23/2019	2:39:31	740	70.1	41.4	0.2
4/23/2019	2:40:31	743	70	41.4	0.2
4/23/2019	2:41:31	738	69.8	40.7	0.2
4/23/2019	2:42:31	735	69.4	40.7	0.2
4/23/2019	2:43:31	736	69.4	41.4	0.1
4/23/2019	2:44:31	735	69.4	41.5	0.2
4/23/2019	2:45:31	737	69.4	41.6	0.1
4/23/2019	2:46:31	735	69.4	41.6	0.2
4/23/2019	2:47:31	736	69.5	41.6	0.1

4/23/2019	2:48:31	736	69.6	41.6	0.1
4/23/2019	2:49:31	735	69.7	41.6	0.1
4/23/2019	2:50:31	737	69.7	41.7	0.1
4/23/2019	2:51:31	765	69.8	42.3	0.1
4/23/2019	2:52:31	790	70	42.6	0.1
4/23/2019	2:53:31	821	70.2	43.1	0.2
4/23/2019	2:54:31	837	70.3	43.3	0.2
4/23/2019	2:55:31	852	70.1	43.4	0.5
4/23/2019	2:56:31	855	69.5	42.9	0.5
4/23/2019	2:57:31	850	69	43.1	0.5
4/23/2019	2:58:31	855	69.1	43.6	0.3
4/23/2019	2:59:31	864	69.3	43.8	0.3
4/23/2019	3:00:31	870	69.5	43.7	0.1
4/23/2019	3:01:31	875	69.7	43.7	0.3
4/23/2019	3:02:31	883	69.8	43.7	0.3
4/23/2019	3:03:31	893	69.9	43.7	0.3
4/23/2019	3:04:31	909	70	43.9	0.3
4/23/2019	3:05:31	915	70.1	43.9	0.4
4/23/2019	3:06:31	918	70.2	43.9	0.2
4/23/2019	3:07:31	925	70.2	43.9	0.2
4/23/2019	3:08:31	926	70.3	43.9	0.4
4/23/2019	3:09:31	933	70.3	44	0.3
4/23/2019	3:10:31	927	70.1	43.8	0.8
4/23/2019	3:11:31	916	69.6	43.5	0.8
4/23/2019	3:12:31	899	69.2	43.4	0.7
4/23/2019	3:13:31	887	69.2	43.7	0.7
4/23/2019	3:14:31	889	69.4	43.9	0.5
4/23/2019	3:15:31	897	69.5	43.9	0.5
4/23/2019	3:16:31	899	69.7	43.8	0.6
4/23/2019	3:17:31	905	69.8	43.8	0.5
4/23/2019	3:18:31	909	69.9	43.8	0.5
4/23/2019	3:19:31	914	70	43.8	0.5
4/23/2019	3:20:31	918	70.1	43.7	0.5
4/23/2019	3:21:31	922	70.1	43.8	0.6

4/23/2019	3:22:31	926	70.2	43.8	0.5
4/23/2019	3:23:31	929	70.2	43.9	0.5
4/23/2019	3:24:31	934	70.3	43.9	0.4
4/23/2019	3:25:31	932	70.1	43.9	0.6
4/23/2019	3:26:31	921	69.7	43.6	0.5
4/23/2019	3:27:31	903	69.3	43.3	0.5
4/23/2019	3:28:31	891	69.1	43.7	0.4
4/23/2019	3:29:31	888	69.3	43.8	0.3
4/23/2019	3:30:31	894	69.5	43.8	0.3
4/23/2019	3:31:31	902	69.6	43.8	0.4
4/23/2019	3:32:31	908	69.8	43.8	0.3
4/23/2019	3:33:31	910	69.9	43.8	0.5
4/23/2019	3:34:31	916	70	43.8	0.3
4/23/2019	3:35:31	919	70	43.8	0.4
4/23/2019	3:36:31	924	70.1	43.9	0.4
4/23/2019	3:37:31	929	70.1	44	0.4
4/23/2019	3:38:31	935	70.2	44	0.4
4/23/2019	3:39:31	936	70.2	44.1	0.3
4/23/2019	3:40:31	938	70.3	44.1	0.4
4/23/2019	3:41:31	932	70	44	0.4
4/23/2019	3:42:31	914	69.6	43.6	0.4
4/23/2019	3:43:31	895	69.3	43.6	0.5
4/23/2019	3:44:31	891	69.4	43.9	0.4
4/23/2019	3:45:31	897	69.5	44	0.2
4/23/2019	3:46:31	900	69.7	44	0.3
4/23/2019	3:47:31	901	69.8	44	0.2
4/23/2019	3:48:31	902	69.9	44	0.2
4/23/2019	3:49:31	919	70	44.2	0.4
4/23/2019	3:50:31	928	70.1	44.3	0.3
4/23/2019	3:51:31	928	70.1	44.3	0.4
4/23/2019	3:52:31	934	70.2	44.4	0.4
4/23/2019	3:53:31	941	70.2	44.5	0.5
4/23/2019	3:54:31	946	70.2	44.5	0.3
4/23/2019	3:55:31	941	70.1	44.5	0.3

4/23/2019	3:56:31	933	69.8	44.4	0.6
4/23/2019	3:57:31	909	69.4	43.9	0.4
4/23/2019	3:58:31	896	69	44.1	0.4
4/23/2019	3:59:31	892	69.2	44.4	0.2
4/23/2019	4:00:31	901	69.4	44.5	0.3
4/23/2019	4:01:31	913	69.6	44.6	0.3
4/23/2019	4:02:31	918	69.7	44.5	0.2
4/23/2019	4:03:31	925	69.8	44.5	0.3
4/23/2019	4:04:31	928	69.9	44.6	0.3
4/23/2019	4:05:31	933	70	44.6	0.3
4/23/2019	4:06:31	936	70	44.6	0.3
4/23/2019	4:07:31	939	70.1	44.7	0.4
4/23/2019	4:08:31	942	70.1	44.7	0.3
4/23/2019	4:09:31	944	70.1	44.8	0.4
4/23/2019	4:10:31	945	70.1	44.9	0.4
4/23/2019	4:11:31	937	69.9	44.9	0.4
4/23/2019	4:12:31	914	69.4	44.5	0.5
4/23/2019	4:13:31	901	69	44.8	0.3
4/23/2019	4:14:31	903	69.2	45	0.3
4/23/2019	4:15:31	912	69.4	45	0.4
4/23/2019	4:16:31	913	69.6	45	0.2
4/23/2019	4:17:31	919	69.7	44.9	0.2
4/23/2019	4:18:31	923	69.8	44.9	0.3
4/23/2019	4:19:31	928	69.9	44.9	0.2
4/23/2019	4:20:31	933	70	44.9	0.3
4/23/2019	4:21:31	934	70	44.9	0.3
4/23/2019	4:22:31	935	70	45	0.3
4/23/2019	4:23:31	938	70.1	45.1	0.3
4/23/2019	4:24:31	944	70.1	45.2	0.4
4/23/2019	4:25:31	951	70.1	45.3	0.4
4/23/2019	4:26:31	939	69.9	45.2	0.3
4/23/2019	4:27:31	914	69.4	44.7	0.3
4/23/2019	4:28:31	895	69	44.8	0.4
4/23/2019	4:29:31	898	69.1	45.2	0.2

4/23/2019	4:30:31	910	69.3	45.3	0.3
4/23/2019	4:31:31	914	69.5	45.3	0.3
4/23/2019	4:32:31	917	69.6	45.3	0.3
4/23/2019	4:33:31	921	69.7	45.3	0.3
4/23/2019	4:34:31	923	69.8	45.2	0.3
4/23/2019	4:35:31	926	69.9	45.3	0.3
4/23/2019	4:36:31	933	69.9	45.3	0.5
4/23/2019	4:37:31	933	70	45.3	0.5
4/23/2019	4:38:31	936	70	45.4	0.5
4/23/2019	4:39:31	938	70	45.5	0.6
4/23/2019	4:40:31	940	70	45.6	0.6
4/23/2019	4:41:31	927	69.7	45.5	0.4
4/23/2019	4:42:31	907	69.3	45.1	0.5
4/23/2019	4:43:31	891	68.9	45.2	0.5
4/23/2019	4:44:31	892	69	45.4	0.3
4/23/2019	4:45:31	898	69.2	45.5	0.4
4/23/2019	4:46:31	901	69.3	45.5	0.5
4/23/2019	4:47:31	912	69.5	45.4	0.8
4/23/2019	4:48:31	909	69.6	45.4	0.8
4/23/2019	4:49:31	912	69.6	45.4	0.8
4/23/2019	4:50:31	916	69.7	45.5	0.8
4/23/2019	4:51:31	922	69.8	45.6	0.8
4/23/2019	4:52:31	924	69.8	45.6	0.8
4/23/2019	4:53:31	932	69.9	45.7	0.8
4/23/2019	4:54:31	936	69.9	45.8	0.8
4/23/2019	4:55:31	943	69.9	45.8	0.8
4/23/2019	4:56:31	938	69.7	45.8	0.7
4/23/2019	4:57:31	921	69.3	45.4	0.8
4/23/2019	4:58:31	896	69	45.1	0.6
4/23/2019	4:59:31	888	68.9	45.6	0.5
4/23/2019	5:00:31	896	69	45.7	0.6
4/23/2019	5:01:31	903	69.2	45.8	0.5
4/23/2019	5:02:31	909	69.3	45.8	0.6
4/23/2019	5:03:31	920	69.4	45.8	0.5



4/23/2019	5:04:31	921	69.5	45.9	0.4
4/23/2019	5:05:31	932	69.7	46.2	0.5
4/23/2019	5:06:31	918	69.7	46.2	0.5
4/23/2019	5:07:31	900	69.8	46.3	0.5
4/23/2019	5:08:31	884	69.7	46.4	0.6
4/23/2019	5:09:31	867	69.7	46.6	0.4
4/23/2019	5:10:31	854	69.7	46.7	0.5
4/23/2019	5:11:31	842	69.7	46.8	0.5
4/23/2019	5:12:31	823	69.6	46.5	0.5
4/23/2019	5:13:31	799	69.1	45.6	0.5
4/23/2019	5:14:31	778	68.6	45.7	0.4
4/23/2019	5:15:31	767	68.7	46.2	0.3
4/23/2019	5:16:31	762	68.8	46.2	0.3
4/23/2019	5:17:31	760	68.9	46.3	0.2
4/23/2019	5:18:31	755	69.1	46.3	0.2
4/23/2019	5:19:31	751	69.2	46.3	0.3
4/23/2019	5:20:31	747	69.2	46.4	0.3
4/23/2019	5:21:31	742	69.3	46.5	0.3
4/23/2019	5:22:31	741	69.4	46.6	0.3
4/23/2019	5:23:31	737	69.4	46.6	0.3
4/23/2019	5:24:31	732	69.5	46.7	0.3
4/23/2019	5:25:31	731	69.5	46.9	0.3
4/23/2019	5:26:31	728	69.5	47	0.3
4/23/2019	5:27:31	722	69.4	46.9	0.4
4/23/2019	5:28:31	713	69	46.2	0.3
4/23/2019	5:29:31	703	68.4	45.8	0.3
4/23/2019	5:30:31	699	68.4	46.3	0.3
4/23/2019	5:31:31	699	68.5	46.4	0.2
4/23/2019	5:32:31	698	68.7	46.4	0.1
4/23/2019	5:33:31	696	68.9	46.4	0.2
4/23/2019	5:34:31	697	69	46.4	0.1
4/23/2019	5:35:31	694	69.1	46.4	0.2
4/23/2019	5:36:31	693	69.1	46.6	0.2
4/23/2019	5:37:31	692	69.2	46.7	0.3

4/23/2019	5:38:31	693	69.2	46.8	0.2
4/23/2019	5:39:31	692	69.3	46.9	0.3
4/23/2019	5:40:31	690	69.3	46.9	0.3
4/23/2019	5:41:31	691	69.3	47.1	0.3
4/23/2019	5:42:31	690	69.4	47.2	0.3
4/23/2019	5:43:31	688	69.3	47.2	0.2
4/23/2019	5:44:31	683	68.8	46.4	0.3
4/23/2019	5:45:31	681	68.3	46.1	0.3
4/23/2019	5:46:31	680	68.3	46.6	0.1
4/23/2019	5:47:31	682	68.4	46.7	0.2
4/23/2019	5:48:31	684	68.5	46.7	0.1
4/23/2019	5:49:31	689	68.7	46.7	0.1
4/23/2019	5:50:31	689	68.8	46.8	0.1
4/23/2019	5:51:31	695	68.9	46.9	0.2
4/23/2019	5:52:31	701	69	47	0.2
4/23/2019	5:53:31	734	69.2	47.5	0.5
4/23/2019	5:54:31	773	69.4	47.5	0.5
4/23/2019	5:55:31	791	69.5	47.3	0.4
4/23/2019	5:56:31	807	69.6	47.3	0.5
4/23/2019	5:57:31	817	69.7	47.3	0.4
4/23/2019	5:58:31	826	69.8	47.2	0.6
4/23/2019	5:59:31	833	69.7	47.1	0.5
4/23/2019	6:00:31	827	69.2	46.5	0.5
4/23/2019	6:01:31	824	68.8	46.2	0.4
4/23/2019	6:02:31	821	68.7	46.4	0.3
4/23/2019	6:03:31	830	68.9	46.5	0.3
4/23/2019	6:04:31	835	69.1	46.5	0.6
4/23/2019	6:05:31	841	69.2	46.5	0.6
4/23/2019	6:06:31	852	69.3	46.5	0.6
4/23/2019	6:07:31	857	69.4	46.4	0.6
4/23/2019	6:08:31	862	69.5	46.4	0.5
4/23/2019	6:09:31	870	69.6	46.5	0.5
4/23/2019	6:10:31	876	69.6	46.5	0.5
4/23/2019	6:11:31	883	69.6	46.6	0.5

4/23/2019	6:12:31	889	69.7	46.6	0.5
4/23/2019	6:13:31	897	69.7	46.7	0.5
4/23/2019	6:14:31	907	69.7	46.8	0.5
4/23/2019	6:15:31	905	69.7	46.9	0.6
4/23/2019	6:16:31	889	69.3	46.3	0.5
4/23/2019	6:17:31	877	68.9	46	0.5
4/23/2019	6:18:31	864	68.7	46.3	0.5
4/23/2019	6:19:31	866	68.8	46.5	0.4
4/23/2019	6:20:31	871	69	46.6	0.3
4/23/2019	6:21:31	884	69.1	46.7	0.3
4/23/2019	6:22:31	897	69.2	46.7	0.3
4/23/2019	6:23:31	900	69.3	46.7	0.3
4/23/2019	6:24:31	913	69.6	47	0.4
4/23/2019	6:25:31	922	69.7	47.2	0.3
4/23/2019	6:26:31	907	69.7	47.3	0.4
4/23/2019	6:27:31	891	69.6	47.3	0.4
4/23/2019	6:28:31	875	69.6	47.4	0.4
4/23/2019	6:29:31	866	69.5	47.6	0.4
4/23/2019	6:30:31	858	69.5	47.7	0.4
4/23/2019	6:31:31	849	69.5	47.8	0.4
4/23/2019	6:32:31	836	69.3	47.7	0.4
4/23/2019	6:33:31	817	68.9	47	0.4
4/23/2019	6:34:31	796	68.5	46.6	0.4
4/23/2019	6:35:31	781	68.3	47.1	0.3
4/23/2019	6:36:31	773	68.4	47.3	0.2
4/23/2019	6:37:31	769	68.5	47.3	0.2
4/23/2019	6:38:31	764	68.6	47.3	0.2
4/23/2019	6:39:31	762	68.7	47.2	0.2
4/23/2019	6:40:31	758	68.9	47.3	0.2
4/23/2019	6:41:31	755	68.9	47.3	0.2
4/23/2019	6:42:31	755	69	47.4	0.2
4/23/2019	6:43:31	751	69	47.5	0.2
4/23/2019	6:44:31	751	69.1	47.7	0.3
4/23/2019	6:45:31	749	69.1	47.8	0.3

4/23/2019	6:46:31	746	69.2	47.9	0.3
4/23/2019	6:47:31	747	69.2	48.1	0.3
4/23/2019	6:48:31	746	69.2	48.2	0.4
4/23/2019	6:49:31	745	69.1	48.2	0.3
4/23/2019	6:50:31	741	68.8	47.6	0.5
4/23/2019	6:51:31	738	68.6	47.3	0.3
4/23/2019	6:52:31	734	68.4	47.4	0.3
4/23/2019	6:53:31	734	68.4	47.5	0.3
4/23/2019	6:54:31	736	68.5	47.6	0.3
4/23/2019	6:55:31	735	68.6	47.6	0.3
4/23/2019	6:56:31	736	68.6	47.6	0.3
4/23/2019	6:57:31	738	68.7	47.6	0.4
4/23/2019	6:58:31	738	68.8	47.7	0.2
4/23/2019	6:59:31	738	68.8	47.8	0.3
4/23/2019	7:00:31	742	68.9	47.9	0.3
4/23/2019	7:01:31	745	69	47.9	0.3
4/23/2019	7:02:31	746	69	48	0.5
4/23/2019	7:03:31	748	69.1	48.1	0.4
4/23/2019	7:04:31	750	69.1	48.3	0.4
4/23/2019	7:05:31	755	69.1	48.4	0.4
4/23/2019	7:06:31	761	69	48.5	0.3
4/23/2019	7:07:31	758	68.8	47.8	0.5
4/23/2019	7:08:31	757	68.2	47.2	0.4
4/23/2019	7:09:31	754	68	47.6	0.3
4/23/2019	7:10:31	758	68.1	47.8	0.4
4/23/2019	7:11:31	762	68.2	47.9	0.3
4/23/2019	7:12:31	765	68.4	47.9	0.2
4/23/2019	7:13:31	765	68.5	47.9	0.3
4/23/2019	7:14:31	771	68.6	48	0.2
4/23/2019	7:15:31	771	68.7	48.1	0.4
4/23/2019	7:16:31	772	68.8	48.2	0.3
4/23/2019	7:17:31	773	68.8	48.3	0.3
4/23/2019	7:18:31	777	68.9	48.5	0.4
4/23/2019	7:19:31	778	69	48.5	0.4

4/23/2019	7:20:31	778	69	48.6	0.4
4/23/2019	7:21:31	778	69	48.8	0.4
4/23/2019	7:22:31	779	69.1	48.8	0.4
4/23/2019	7:23:31	779	69.1	48.9	0.4
4/23/2019	7:24:31	778	68.9	48.5	0.4
4/23/2019	7:25:31	772	68.6	47.7	0.4
4/23/2019	7:26:31	765	68.1	47.6	0.4
4/23/2019	7:27:31	767	68.2	48	0.3
4/23/2019	7:28:31	768	68.4	48.1	0.3
4/23/2019	7:29:31	767	68.5	48.2	0.3
4/23/2019	7:30:31	769	68.6	48.4	0.2
4/23/2019	7:31:31	767	68.8	48.7	0.3
4/23/2019	7:32:31	771	68.9	49.2	0.3
4/23/2019	7:33:31	771	68.9	49.5	0.2
4/23/2019	7:34:31	773	69	49.9	0.3
4/23/2019	7:35:31	771	69.1	50	0.2
4/23/2019	7:36:31	773	69.1	50.3	0.2
4/23/2019	7:37:31	776	69.2	50.6	0.2
4/23/2019	7:38:31	778	69.2	50.8	0.4
4/23/2019	7:39:31	783	69.3	51.2	0.3
4/23/2019	7:40:31	784	69.2	51.2	0.2
4/23/2019	7:41:31	787	68.9	50.5	0.2
4/23/2019	7:42:31	787	68.4	49.6	0.2
4/23/2019	7:43:31	789	68.3	50	0.2
4/23/2019	7:44:31	793	68.4	50.3	0.1
4/23/2019	7:45:31	796	68.5	50.3	0.1
4/23/2019	7:46:30	799	68.7	50.7	0.1
4/23/2019	7:47:30	803	68.9	50.7	0.1
4/23/2019	7:48:30	808	69	50.8	0.1
4/23/2019	7:49:30	812	69.1	50.9	0.2
4/23/2019	7:50:30	814	69.2	51	0.1
4/23/2019	7:51:30	818	69.2	51.1	0.1
4/23/2019	7:52:30	821	69.3	51.3	0.2
4/23/2019	7:53:30	820	69.3	51.3	0.2



4/23/2019	7:54:30	825	69.4	51.6	0.3
4/23/2019	7:55:30	826	69.4	51.6	0.2
4/23/2019	7:56:30	829	69.5	51.7	0.2
4/23/2019	7:57:30	832	69.5	51.7	0.2
4/23/2019	7:58:30	837	69.5	51.9	0.3
4/23/2019	7:59:30	841	69.4	51.8	0.6
4/23/2019	8:00:30	845	69.2	51.1	0.6
4/23/2019	8:01:30	845	68.8	50.7	0.8
4/23/2019	8:02:30	849	68.7	51	0.8
4/23/2019	8:03:30	852	68.8	51.2	0.8
4/23/2019	8:04:30	856	68.9	51.3	0.8
4/23/2019	8:05:30	861	69.1	51.4	0.8
4/23/2019	8:06:30	870	69.2	51.6	0.8
4/23/2019	8:07:30	878	69.3	51.8	0.9
4/23/2019	8:08:30	886	69.4	51.9	1
4/23/2019	8:09:30	891	69.4	52.1	0.9
4/23/2019	8:10:30	898	69.5	52.2	1.1
4/23/2019	8:11:30	901	69.5	52.5	1.3
4/23/2019	8:12:30	907	69.5	52.6	1.2
4/23/2019	8:13:30	911	69.6	52.7	1.4
4/23/2019	8:14:30	912	69.6	52.9	1.3
4/23/2019	8:15:30	910	69.5	52.6	1.4
4/23/2019	8:16:30	899	69.1	51.9	1.2
4/23/2019	8:17:30	889	68.7	51.3	1.2
4/23/2019	8:18:30	884	68.6	51.5	1.1
4/23/2019	8:19:30	884	68.7	51.7	1
4/23/2019	8:20:30	910	68.9	51.9	1
4/23/2019	8:21:30	943	69.2	52.3	0.9
4/23/2019	8:22:30	972	69.4	52.3	1
4/23/2019	8:23:30	983	69.6	52.5	0.9
4/23/2019	8:24:30	967	69.6	52.3	0.9
4/23/2019	8:25:30	961	69.6	52.3	1
4/23/2019	8:26:30	952	69.6	52.2	1
4/23/2019	8:27:30	943	69.7	52.3	0.9

4/23/2019	8:28:30	937	69.7	52.4	0.9
4/23/2019	8:29:30	931	69.7	52.4	0.9
4/23/2019	8:30:30	922	69.7	52.5	0.9
4/23/2019	8:31:30	913	69.6	52	0.9
4/23/2019	8:32:30	905	69.4	51.5	0.9
4/23/2019	8:33:30	897	69.2	51	0.9
4/23/2019	8:34:30	889	69.1	50.7	0.8
4/23/2019	8:35:30	883	69.2	50.8	0.8
4/23/2019	8:36:30	882	69.2	50.7	0.8
4/23/2019	8:37:30	874	69.3	50.6	0.8
4/23/2019	8:38:30	867	69.4	50.5	0.8
4/23/2019	8:39:30	857	69.5	50.4	0.8
4/23/2019	8:40:30	851	69.5	50.3	0.8
4/23/2019	8:41:30	850	69.6	50.3	0.8
4/23/2019	8:42:30	847	69.6	50.2	0.7
4/23/2019	8:43:30	843	69.7	50.1	0.8
4/23/2019	8:44:30	845	69.7	50	0.8
4/23/2019	8:45:30	845	69.7	50	0.7
4/23/2019	8:46:30	840	69.7	49.9	0.7
4/23/2019	8:47:30	837	69.4	49.4	0.7
4/23/2019	8:48:30	834	69	48.9	0.7
4/23/2019	8:49:30	829	68.9	49	0.7
4/23/2019	8:50:30	829	68.9	49.2	0.6
4/23/2019	8:51:30	832	69	49.2	0.6
4/23/2019	8:52:30	831	69.1	49.2	0.5
4/23/2019	8:53:30	834	69.2	49.3	0.5
4/23/2019	8:54:30	833	69.3	49.4	0.6
4/23/2019	8:55:30	833	69.4	49.4	0.5
4/23/2019	8:56:30	832	69.5	49.5	0.5
4/23/2019	8:57:30	830	69.5	49.6	0.4
4/23/2019	8:58:30	828	69.5	49.7	0.4
4/23/2019	8:59:30	827	69.6	49.8	0.6
4/23/2019	9:00:30	825	69.6	49.9	0.5
4/23/2019	9:01:30	821	69.7	50	0.4

4/23/2019	9:02:30	818	69.7	50	0.5
4/23/2019	9:03:30	811	69.5	49.6	0.4
4/23/2019	9:04:30	805	69.2	49.3	0.4
4/23/2019	9:05:30	798	69.1	49.2	0.4
4/23/2019	9:06:30	792	69.1	49.3	0.2
4/23/2019	9:07:30	793	69.2	49.4	0.4
4/23/2019	9:08:30	788	69.2	49.3	0.2
4/23/2019	9:09:30	787	69.3	49.3	0.2
4/23/2019	9:10:30	783	69.4	49.2	0.3
4/23/2019	9:11:30	781	69.4	49.1	0.2
4/23/2019	9:12:30	781	69.5	49.1	0.2
4/23/2019	9:13:30	777	69.5	49.2	0.2
4/23/2019	9:14:30	774	69.6	49.2	0.1
4/23/2019	9:15:30	770	69.7	49.3	0.1
4/23/2019	9:16:30	770	69.7	49.3	0.2
4/23/2019	9:17:30	767	69.7	49.5	0.1
4/23/2019	9:18:30	766	69.8	49.5	0.2
4/23/2019	9:19:30	761	69.6	49.3	0.1
4/23/2019	9:20:30	758	69.3	48.8	0.1
4/23/2019	9:21:30	752	69	48.5	0.2
4/23/2019	9:22:30	748	69	48.8	0.1
4/23/2019	9:23:30	746	69.1	48.9	0.1
4/23/2019	9:24:30	747	69.2	49	0.1
4/23/2019	9:25:30	745	69.3	49.1	0.1
4/23/2019	9:26:30	745	69.4	49.3	0.1
4/23/2019	9:27:30	742	69.5	49.3	0
4/23/2019	9:28:30	742	69.6	49.4	0.1
4/23/2019	9:29:30	741	69.6	49.5	0.1
4/23/2019	9:30:30	740	69.7	49.7	0.1
4/23/2019	9:31:30	737	69.7	49.7	0.1
4/23/2019	9:32:30	737	69.7	49.7	0.1
4/23/2019	9:33:30	736	69.8	49.7	0.1
4/23/2019	9:34:30	733	69.8	49.8	0.1
4/23/2019	9:35:30	730	69.8	49.6	0.1

4/23/2019	9:36:30	729	69.6	49.3	0.1
4/23/2019	9:37:30	729	69.2	48.9	0
4/23/2019	9:38:30	722	69	48.9	0.1
4/23/2019	9:39:30	721	69.1	49	0.1
4/23/2019	9:40:30	724	69.2	49.1	0
4/23/2019	9:41:30	723	69.3	49.1	0
4/23/2019	9:42:30	720	69.4	49.3	0
4/23/2019	9:43:30	719	69.5	49.3	0
4/23/2019	9:44:30	722	69.6	49.4	0
4/23/2019	9:45:30	722	69.7	49.5	0.1
4/23/2019	9:46:30	722	69.8	49.6	0
4/23/2019	9:47:30	722	69.8	49.7	0
4/23/2019	9:48:30	721	69.9	49.9	0
4/23/2019	9:49:30	721	69.9	50	0.1
4/23/2019	9:50:30	719	69.9	50	0.1
4/23/2019	9:51:30	715	69.9	49.8	0
4/23/2019	9:52:30	715	69.7	49.6	0
4/23/2019	9:53:30	712	69.5	49.2	0.1
4/23/2019	9:54:30	710	69.4	48.8	0
4/23/2019	9:55:30	708	69.4	48.8	0
4/23/2019	9:56:30	706	69.4	48.9	0
4/23/2019	9:57:30	705	69.5	49	0
4/23/2019	9:58:30	704	69.6	49.2	0
4/23/2019	9:59:30	705	69.7	49.2	0
4/23/2019	10:00:30	708	69.7	49.2	0
4/23/2019	10:01:30	710	69.8	49.3	0
4/23/2019	10:02:30	706	69.9	49.4	0
4/23/2019	10:03:30	709	69.9	49.5	0
4/23/2019	10:04:30	711	70	49.6	0
4/23/2019	10:05:30	713	70	49.7	0
4/23/2019	10:06:30	719	70	49.8	0
4/23/2019	10:07:30	722	70.1	49.9	0
4/23/2019	10:08:30	727	70.1	50.1	0
4/23/2019	10:09:30	732	70.2	50.1	0

4/23/2019	10:10:30	735	70.2	50.1	0
4/23/2019	10:11:30	739	70.2	50.2	0
4/23/2019	10:12:30	746	70.3	50.3	0
4/23/2019	10:13:30	751	70.3	50.4	0
4/23/2019	10:14:30	756	70.3	50.5	0
4/23/2019	10:15:30	760	70.3	50.5	0
4/23/2019	10:16:30	762	70.4	50.6	0
4/23/2019	10:17:30	768	70.4	50.7	0
4/23/2019	10:18:30	774	70.4	50.9	0
4/23/2019	10:19:30	779	70.5	50.9	0
4/23/2019	10:20:30	784	70.5	50.9	0
4/23/2019	10:21:30	787	70.5	51	0
4/23/2019	10:22:30	793	70.5	51.1	0
4/23/2019	10:23:30	807	70.6	51.3	0
4/23/2019	10:24:30	830	70.6	51.7	0
4/23/2019	10:25:30	850	70.7	51.8	0
4/23/2019	10:26:30	854	70.7	51.8	0
4/23/2019	10:27:30	850	70.7	51.9	0
4/23/2019	10:28:30	850	70.6	51.9	0
4/23/2019	10:29:30	850	70.6	52	0
4/23/2019	10:30:30	849	70.6	52.1	0
4/23/2019	10:31:30	846	70.6	52.1	0
4/23/2019	10:32:30	845	70.7	52.1	0
4/23/2019	10:33:30	839	70.7	52.2	0
4/23/2019	10:34:30	835	70.7	52.2	0
4/23/2019	10:35:30	830	70.6	51.8	0
4/23/2019	10:36:30	824	70.5	51.2	0
4/23/2019	10:37:30	817	70.2	50.7	0
4/23/2019	10:38:30	813	70	50.3	0
4/23/2019	10:39:30	812	69.8	49.9	0
4/23/2019	10:40:30	813	69.6	49.7	0
4/23/2019	10:41:30	813	69.7	49.7	0
4/23/2019	10:42:30	848	69.9	50.1	0
4/23/2019	10:43:30	871	70.1	50.4	0



4/23/2019	10:44:30	893	70.3	50.6	0
4/23/2019	10:45:30	918	70.4	50.7	0
4/23/2019	10:46:30	946	70.6	51.1	0
4/23/2019	10:47:30	984	70.8	51.2	0
4/23/2019	10:48:30	1007	70.8	51.4	0
4/23/2019	10:49:30	1005	70.6	51.4	0
4/23/2019	10:50:30	992	70.2	50.6	0
4/23/2019	10:51:30	978	69.8	50	0
4/23/2019	10:52:30	964	69.5	49.9	0
4/23/2019	10:53:30	962	69.8	50.7	0.1
4/23/2019	10:54:30	962	70.1	51.1	0
4/23/2019	10:55:30	959	70.3	51.4	0
4/23/2019	10:56:30	951	70.4	51.5	0
4/23/2019	10:57:30	950	70.6	51.6	0
4/23/2019	10:58:30	942	70.6	51.7	0
4/23/2019	10:59:30	936	70.7	51.7	0
4/23/2019	11:00:30	938	70.9	51.9	0
4/23/2019	11:01:30	946	71	52.1	0
4/23/2019	11:02:30	964	71.2	52.1	0
4/23/2019	11:03:30	1001	71.3	52.2	0
4/23/2019	11:04:30	1011	71.2	51.7	0
4/23/2019	11:05:30	1016	71	51.3	0
4/23/2019	11:06:30	1017	70.5	50.4	0
4/23/2019	11:07:30	1010	70.2	50	0
4/23/2019	11:08:30	1015	70.4	50.6	0
4/23/2019	11:09:30	1029	70.6	50.8	0
4/23/2019	11:10:30	1038	70.7	50.9	0
4/23/2019	11:11:30	1053	70.9	51.1	0
4/23/2019	11:12:30	1071	71	51.1	0
4/23/2019	11:13:30	1080	71.1	51.3	0
4/23/2019	11:14:30	1094	71.2	51.6	0
4/23/2019	11:15:30	1112	71.4	51.9	0
4/23/2019	11:16:30	1092	71.4	51.7	0
4/23/2019	11:17:30	1067	71.4	51.5	0

4/23/2019	11:18:30	1040	71.4	51.4	0
4/23/2019	11:19:30	1010	71.2	50.9	0
4/23/2019	11:20:30	1000	70.9	50.3	0
4/23/2019	11:21:30	986	70.6	50	0
4/23/2019	11:22:30	978	70.4	49.8	0
4/23/2019	11:23:30	969	70.4	49.9	0
4/23/2019	11:24:30	973	70.8	50.4	0
4/23/2019	11:25:30	977	71	50.7	0
4/23/2019	11:26:30	1003	71.2	50.9	0
4/23/2019	11:27:30	992	71.2	50.5	0
4/23/2019	11:28:30	964	71.2	50.2	0
4/23/2019	11:29:30	935	71.1	50.1	0
4/23/2019	11:30:30	911	71.1	50.1	0
4/23/2019	11:31:30	893	71.2	50.1	0
4/23/2019	11:32:30	872	70.9	49.6	0
4/23/2019	11:33:30	855	70.5	48.9	0
4/23/2019	11:34:30	840	70.2	48.5	0
4/23/2019	11:35:30	827	70.2	48.5	0
4/23/2019	11:36:30	818	70.3	48.6	0
4/23/2019	11:37:30	807	70.4	48.9	0
4/23/2019	11:38:30	798	70.5	49	0
4/23/2019	11:39:30	792	70.6	49.1	0
4/23/2019	11:40:30	783	70.7	49.1	0
4/23/2019	11:41:30	773	70.8	49.2	0
4/23/2019	11:42:30	765	70.8	49.3	0
4/23/2019	11:43:30	759	70.9	49.4	0
4/23/2019	11:44:30	754	70.9	49.4	0
4/23/2019	11:45:30	747	70.8	49	0
4/23/2019	11:46:30	741	70.6	48.5	0
4/23/2019	11:47:30	731	70.3	48.3	0
4/23/2019	11:48:30	719	70	48.1	0
4/23/2019	11:49:30	711	70.1	48.3	0
4/23/2019	11:50:30	703	70.2	48.6	0
4/23/2019	11:51:30	697	70.3	48.8	0

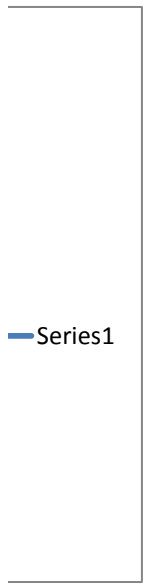
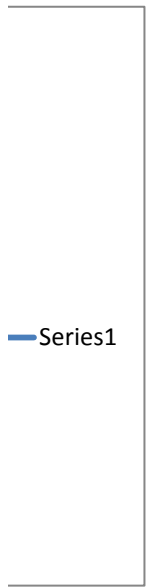
4/23/2019	11:52:30	692	70.4	48.9	0
4/23/2019	11:53:30	686	70.5	48.9	0
4/23/2019	11:54:30	678	70.6	49.1	0
4/23/2019	11:55:30	674	70.7	49.1	0
4/23/2019	11:56:30	667	70.8	49.3	0
4/23/2019	11:57:30	661	70.8	49.4	0
4/23/2019	11:58:30	654	70.8	49.2	0
4/23/2019	11:59:30	651	70.7	48.7	0
4/23/2019	12:00:30	651	70.4	48.4	0
4/23/2019	12:01:30	647	70.2	48	0
4/23/2019	12:02:30	641	70.1	48	0
4/23/2019	12:03:30	636	70.2	48.3	0
4/23/2019	12:04:30	630	70.3	48.6	0
4/23/2019	12:05:30	623	70.4	48.8	0
4/23/2019	12:06:30	619	70.5	48.9	0
4/23/2019	12:07:30	613	70.6	48.9	0
4/23/2019	12:08:30	610	70.6	49.1	0
4/23/2019	12:09:30	602	70.7	49.2	0
4/23/2019	12:10:30	597	70.8	49.4	0
4/23/2019	12:11:30	591	70.8	49.5	0
4/23/2019	12:12:30	589	70.6	49.2	0
4/23/2019	12:13:30	589	70.4	48.7	0
4/23/2019	12:14:30	587	70.2	48.5	0
4/23/2019	12:15:30	585	69.9	48.2	0
4/23/2019	12:16:30	585	70	48.4	0
4/23/2019	12:17:30	582	70.1	48.7	0
4/23/2019	12:18:30	582	70.3	48.7	0
4/23/2019	12:19:30	579	70.4	48.7	0
4/23/2019	12:20:30	576	70.4	48.8	0
4/23/2019	12:21:30	575	70.5	49	0
4/23/2019	12:22:30	569	70.6	49.1	0
4/23/2019	12:23:30	569	70.7	49.2	0
4/23/2019	12:24:30	564	70.7	49.3	0
4/23/2019	12:25:30	563	70.8	49.3	0

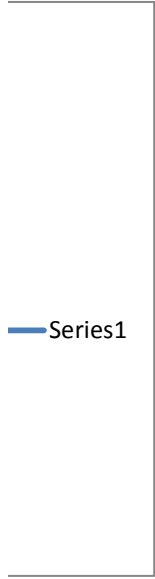
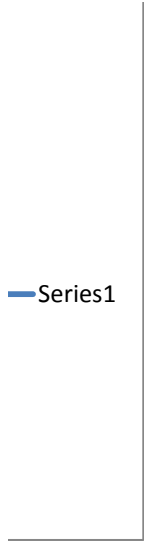
4/23/2019	12:26:30	562	70.6	48.8	0
4/23/2019	12:27:30	564	70.3	48.3	0
4/23/2019	12:28:30	565	70.1	47.9	0
4/23/2019	12:29:30	562	69.9	47.7	0
4/23/2019	12:30:30	561	69.9	47.7	0
4/23/2019	12:31:30	561	70	48	0
4/23/2019	12:32:30	558	70.2	48.3	0
4/23/2019	12:33:30	556	70.3	48.4	0
4/23/2019	12:34:30	553	70.4	48.4	0
4/23/2019	12:35:30	551	70.5	48.5	0
4/23/2019	12:36:30	550	70.6	48.6	0
4/23/2019	12:37:30	547	70.6	48.7	0
4/23/2019	12:38:30	547	70.7	48.8	0
4/23/2019	12:39:30	546	70.7	48.7	0
4/23/2019	12:40:30	548	70.4	48.2	0
4/23/2019	12:41:30	548	70.2	47.9	0
4/23/2019	12:42:30	549	70.1	47.7	0
4/23/2019	12:43:30	548	70	47.6	0
4/23/2019	12:44:30	547	70	47.7	0
4/23/2019	12:45:30	546	70.1	47.9	0
4/23/2019	12:46:30	545	70.3	48.1	0
4/23/2019	12:47:30	543	70.4	48.2	0
4/23/2019	12:48:30	540	70.5	48.3	0
4/23/2019	12:49:30	538	70.6	48.5	0
4/23/2019	12:50:30	536	70.7	48.5	0
4/23/2019	12:51:30	536	70.7	48.5	0
4/23/2019	12:52:30	534	70.8	48.6	0
4/23/2019	12:53:30	538	70.8	48.5	0
4/23/2019	12:54:30	543	70.7	48.2	0
4/23/2019	12:55:30	545	70.5	48.2	0
4/23/2019	12:56:30	546	70.5	48.3	0
4/23/2019	12:57:30	547	70.4	48.3	0
4/23/2019	12:58:30	549	70.4	48.3	0
4/23/2019	12:59:30	549	70.4	48.6	0

4/23/2019	13:00:30	546	70.6	48.8	0
4/23/2019	13:01:30	546	70.6	48.9	0
4/23/2019	13:02:30	545	70.7	49	0
4/23/2019	13:03:30	545	70.8	49	0
4/23/2019	13:04:30	543	70.9	49.1	0
4/23/2019	13:05:30	542	71	49.1	0
4/23/2019	13:06:30	541	71	49.2	0
4/23/2019	13:07:30	542	71.1	49.2	0
4/23/2019	13:08:30	547	71	49	0
4/23/2019	13:09:30	554	70.9	48.7	0
4/23/2019	13:10:30	561	70.7	48.4	0
4/23/2019	13:11:30	563	70.7	48.4	0
4/23/2019	13:12:30	569	70.6	48.3	0
4/23/2019	13:13:30	569	70.6	48.7	0
4/23/2019	13:14:30	578	70.8	49.6	0
4/23/2019	13:15:30	569	70.9	50.1	0
4/23/2019	13:16:30	564	71.1	50.2	0
4/23/2019	13:17:30	558	71.2	50.1	0
4/23/2019	13:18:30	554	71.2	50.2	0
4/23/2019	13:19:30	559	71.3	50.3	0
4/23/2019	13:20:30	609	71.6	50.3	0
4/23/2019	13:21:30	640	71.2	49.4	0
4/23/2019	13:22:30	643	70.8	48.9	0
4/23/2019	13:23:30	643	70.5	48.5	0
4/23/2019	13:24:30	642	70.1	48.1	0
4/23/2019	13:25:30	641	70	48	0
4/23/2019	13:26:30	639	70.1	48.2	0
4/23/2019	13:27:30	636	70.5	48.6	0
4/23/2019	13:28:30	632	70.8	48.7	0
4/23/2019	13:29:30	624	71	48.9	0
4/23/2019	13:30:30	622	71.2	48.9	0
4/23/2019	13:31:30	639	71.4	49.3	0
4/23/2019	13:32:30	666	71.5	49.4	0
4/23/2019	13:33:30	696	71.2	48.5	0



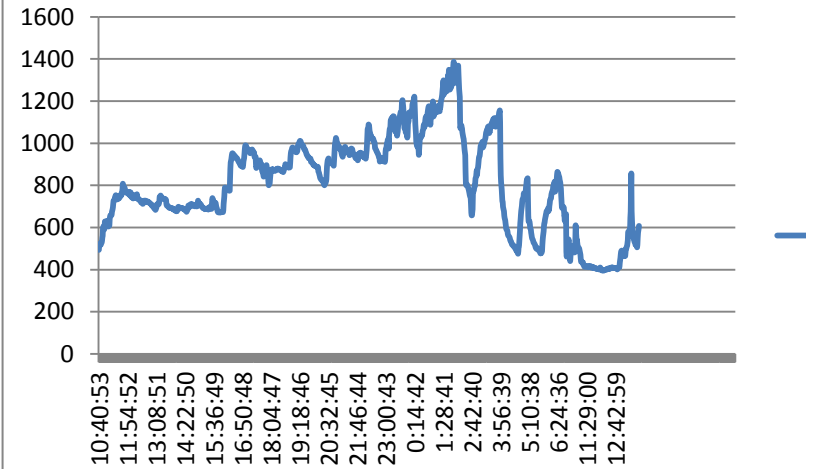
4/23/2019	13:34:30	711	70.8	48.2	0
4/23/2019	13:35:30	724	70.6	48.1	0
4/23/2019	13:36:30	738	70.4	48.1	0
4/23/2019	13:37:30	735	70.5	48.3	0
4/23/2019	13:38:30	724	70.5	48.1	0
4/23/2019	13:39:30	708	70.9	48.7	0
4/23/2019	13:40:30	690	71.1	49.2	0
4/23/2019	13:41:29	676	71.3	49.6	0
4/23/2019	13:42:29	656	71.5	50	0
4/23/2019	13:43:29	644	71.7	50.1	0
4/23/2019	13:44:29	640	71.7	49.9	0
4/23/2019	13:45:29	635	71.5	48.7	0
4/23/2019	13:46:29	635	71.2	48.1	0
4/23/2019	13:47:29	635	70.8	47.7	0



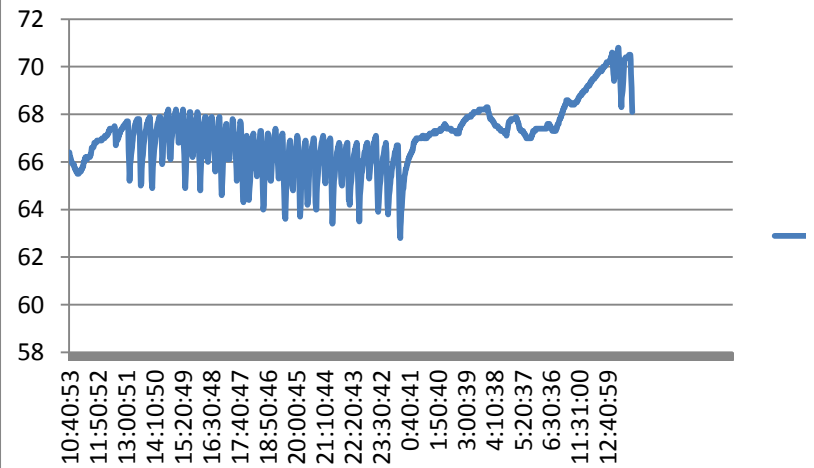


Date	Time	CO2	T	H	CO
Minutes		1393	1393	1393	1393
Minimum		395	62.8	35.3	0
Maximum		1387	70.8	59.9	1.8
Average		809.5384	66.73972	44.36835	0.911089
4/22/2019	10:40:53	493	66.4	54.1	1.2
4/22/2019	10:41:53	510	66.3	54	0.9
4/22/2019	10:42:53	515	66.2	54.4	0.9
4/22/2019	10:43:53	524	66.2	54.6	0.8
4/22/2019	10:44:53	518	66.1	54.2	0.8
4/22/2019	10:45:53	518	66	54.5	0.8
4/22/2019	10:46:53	524	66	54.9	0.8
4/22/2019	10:47:53	528	66	54.3	0.8
4/22/2019	10:48:53	538	65.9	54.3	0.8
4/22/2019	10:49:53	553	65.9	54.3	0.8
4/22/2019	10:50:53	561	65.9	54.6	0.8
4/22/2019	10:51:53	600	65.9	54.7	0.8
4/22/2019	10:52:53	606	65.8	54.7	0.8
4/22/2019	10:53:53	599	65.8	54.7	0.8
4/22/2019	10:54:53	591	65.7	54.5	0.7
4/22/2019	10:55:53	608	65.7	54.7	0.7
4/22/2019	10:56:53	628	65.7	54.9	0.8
4/22/2019	10:57:53	623	65.6	55	0.8
4/22/2019	10:58:53	621	65.6	54.9	0.7
4/22/2019	10:59:53	626	65.6	55.2	0.7
4/22/2019	11:00:53	626	65.5	55.1	0.8
4/22/2019	11:01:52	631	65.5	55.4	0.7
4/22/2019	11:02:52	608	65.5	55	0.7
4/22/2019	11:03:52	621	65.5	55.3	0.7
4/22/2019	11:04:52	623	65.6	55.1	0.6
4/22/2019	11:05:52	604	65.6	54.7	0.7
4/22/2019	11:06:52	607	65.6	54.7	0.6
4/22/2019	11:07:52	611	65.6	54.8	0.7
4/22/2019	11:08:52	641	65.6	55.1	0.6

## Carbon Dioxide (CO2)

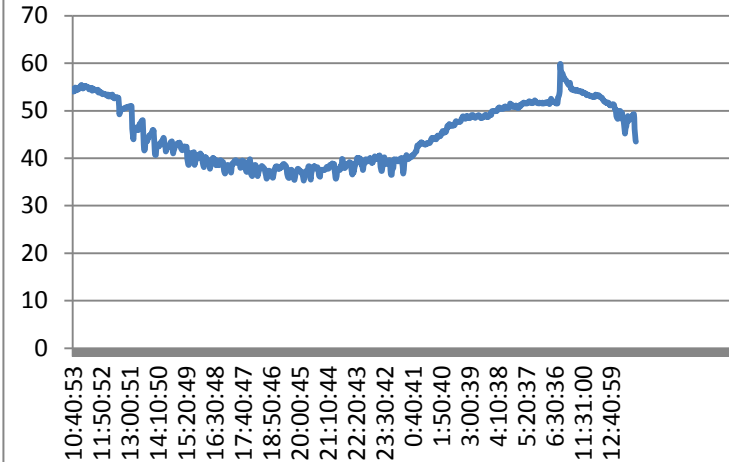


## Temperature (F)

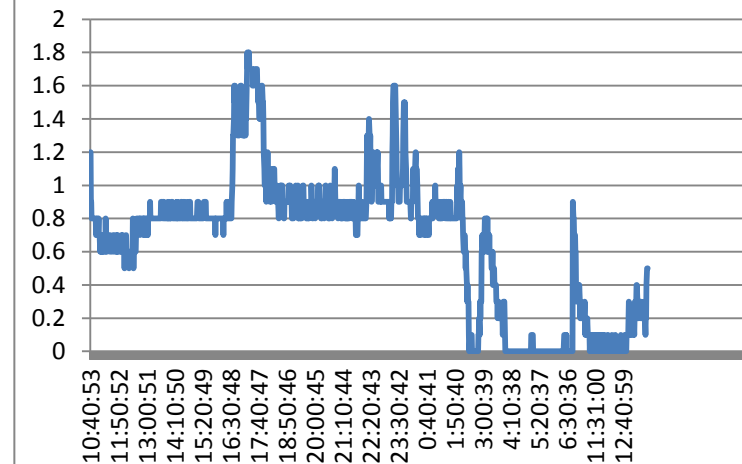


4/22/2019	11:09:52	651	65.6	55.2	0.7
4/22/2019	11:10:52	657	65.7	55.2	0.6
4/22/2019	11:11:52	656	65.7	55.1	0.7
4/22/2019	11:12:52	657	65.7	55.1	0.6
4/22/2019	11:13:52	661	65.8	55	0.7
4/22/2019	11:14:52	674	65.8	55.1	0.7
4/22/2019	11:15:52	687	65.9	55.1	0.7
4/22/2019	11:16:52	695	66	55	0.6
4/22/2019	11:17:52	712	66	55	0.6
4/22/2019	11:18:52	727	66.1	54.9	0.8
4/22/2019	11:19:52	729	66.1	54.7	0.7
4/22/2019	11:20:52	729	66.2	54.5	0.6
4/22/2019	11:21:52	735	66.1	54.5	0.6
4/22/2019	11:22:52	747	66.1	54.8	0.6
4/22/2019	11:23:52	749	66.2	54.8	0.7
4/22/2019	11:24:52	753	66.1	54.7	0.7
4/22/2019	11:25:52	737	66.2	54.7	0.7
4/22/2019	11:26:52	740	66.2	54.7	0.7
4/22/2019	11:27:52	749	66.2	54.8	0.7
4/22/2019	11:28:52	734	66.2	54.2	0.7
4/22/2019	11:29:52	733	66.2	54.3	0.6
4/22/2019	11:30:52	740	66.2	54.4	0.6
4/22/2019	11:31:52	749	66.2	54.6	0.6
4/22/2019	11:32:52	743	66.3	54.5	0.6
4/22/2019	11:33:52	740	66.3	54.4	0.6
4/22/2019	11:34:52	746	66.4	54.4	0.6
4/22/2019	11:35:52	748	66.5	54.4	0.6
4/22/2019	11:36:52	755	66.6	54.4	0.7
4/22/2019	11:37:52	758	66.6	54.3	0.7
4/22/2019	11:38:52	752	66.6	54.2	0.7
4/22/2019	11:39:52	760	66.6	54.2	0.7
4/22/2019	11:40:52	772	66.6	54.3	0.6
4/22/2019	11:41:52	784	66.7	54.4	0.6
4/22/2019	11:42:52	808	66.8	54.4	0.6

### Humidity (%)



### Carbon Monoxide (CO)





4/22/2019	11:43:52	776	66.8	53.9	0.6
4/22/2019	11:44:52	771	66.8	53.8	0.6
4/22/2019	11:45:52	788	66.8	54	0.7
4/22/2019	11:46:52	792	66.8	54.1	0.6
4/22/2019	11:47:52	785	66.8	54	0.6
4/22/2019	11:48:52	776	66.9	53.9	0.7
4/22/2019	11:49:52	770	66.9	53.9	0.6
4/22/2019	11:50:52	770	66.9	53.9	0.6
4/22/2019	11:51:52	768	66.9	53.7	0.6
4/22/2019	11:52:52	769	66.9	53.6	0.6
4/22/2019	11:53:52	762	66.9	53.5	0.6
4/22/2019	11:54:52	761	66.9	53.5	0.6
4/22/2019	11:55:52	765	66.9	53.6	0.6
4/22/2019	11:56:52	768	66.9	53.6	0.6
4/22/2019	11:57:52	760	66.9	53.5	0.7
4/22/2019	11:58:52	760	66.9	53.5	0.6
4/22/2019	11:59:52	764	66.9	53.5	0.6
4/22/2019	12:00:52	767	66.9	53.5	0.6
4/22/2019	12:01:52	751	67	53.5	0.7
4/22/2019	12:02:52	767	67	53.5	0.6
4/22/2019	12:03:52	758	67	53.2	0.6
4/22/2019	12:04:52	750	67	53.2	0.6
4/22/2019	12:05:52	743	67	53.2	0.5
4/22/2019	12:06:52	754	67	53.3	0.6
4/22/2019	12:07:52	748	67	53.4	0.6
4/22/2019	12:08:52	738	67.1	53	0.6
4/22/2019	12:09:52	738	67.1	53	0.7
4/22/2019	12:10:52	748	67.1	53.1	0.6
4/22/2019	12:11:52	753	67.1	53.2	0.6
4/22/2019	12:12:52	749	67.1	53	0.6
4/22/2019	12:13:52	744	67.1	53	0.6
4/22/2019	12:14:52	741	67.1	53.1	0.6
4/22/2019	12:15:52	747	67.2	53.2	0.6
4/22/2019	12:16:52	745	67.2	53.1	0.5

4/22/2019	12:17:52	743	67.2	53.2	0.6
4/22/2019	12:18:52	758	67.3	53.4	0.6
4/22/2019	12:19:52	740	67.3	52.8	0.6
4/22/2019	12:20:51	740	67.4	52.8	0.6
4/22/2019	12:21:51	738	67.4	52.7	0.6
4/22/2019	12:22:51	732	67.4	52.6	0.6
4/22/2019	12:23:51	733	67.4	52.6	0.6
4/22/2019	12:24:51	733	67.4	52.8	0.6
4/22/2019	12:25:51	732	67.4	52.8	0.6
4/22/2019	12:26:51	729	67.4	52.9	0.8
4/22/2019	12:27:51	726	67.4	52.9	0.5
4/22/2019	12:28:51	723	67.4	52.8	0.6
4/22/2019	12:29:51	719	67.4	52.8	0.6
4/22/2019	12:30:51	718	67.4	52.8	0.6
4/22/2019	12:31:51	717	67.4	52.7	0.6
4/22/2019	12:32:51	715	67.5	52.7	0.6
4/22/2019	12:33:51	712	67.4	52.7	0.6
4/22/2019	12:34:51	712	67.1	51	0.7
4/22/2019	12:35:51	722	66.7	49.2	0.8
4/22/2019	12:36:51	728	66.9	49.5	0.8
4/22/2019	12:37:51	728	66.9	49.9	0.8
4/22/2019	12:38:51	728	66.9	50.1	0.8
4/22/2019	12:39:51	727	66.9	50.2	0.8
4/22/2019	12:40:51	727	67	50.2	0.8
4/22/2019	12:41:51	726	67	50.3	0.8
4/22/2019	12:42:51	723	67.1	50.4	0.8
4/22/2019	12:43:51	723	67.1	50.4	0.7
4/22/2019	12:44:51	722	67.2	50.4	0.8
4/22/2019	12:45:51	723	67.2	50.4	0.8
4/22/2019	12:46:51	722	67.3	50.5	0.8
4/22/2019	12:47:51	723	67.3	50.5	0.8
4/22/2019	12:48:51	722	67.3	50.5	0.8
4/22/2019	12:49:51	719	67.4	50.5	0.8
4/22/2019	12:50:51	717	67.4	50.6	0.8

4/22/2019	12:51:51	716	67.4	50.7	0.8
4/22/2019	12:52:51	715	67.4	50.7	0.7
4/22/2019	12:53:51	714	67.5	50.7	0.8
4/22/2019	12:54:51	711	67.5	50.7	0.8
4/22/2019	12:55:51	708	67.5	50.8	0.7
4/22/2019	12:56:51	707	67.5	50.8	0.7
4/22/2019	12:57:51	705	67.6	50.8	0.8
4/22/2019	12:58:51	702	67.6	50.9	0.8
4/22/2019	12:59:51	700	67.6	50.9	0.7
4/22/2019	13:00:51	698	67.6	50.9	0.7
4/22/2019	13:01:51	696	67.6	50.9	0.8
4/22/2019	13:02:51	693	67.7	50.9	0.8
4/22/2019	13:03:51	692	67.7	51	0.7
4/22/2019	13:04:51	689	67.7	50.9	0.8
4/22/2019	13:05:51	687	67.7	51	0.8
4/22/2019	13:06:51	683	67.3	49	0.8
4/22/2019	13:07:51	686	66.5	46.2	0.8
4/22/2019	13:08:51	696	65.8	44.9	0.8
4/22/2019	13:09:51	704	65.2	44.2	0.9
4/22/2019	13:10:51	710	65.5	44	0.8
4/22/2019	13:11:51	709	65.9	45.4	0.8
4/22/2019	13:12:51	708	66.1	45.8	0.8
4/22/2019	13:13:51	712	66.3	45.9	0.8
4/22/2019	13:14:51	711	66.4	46.5	0.8
4/22/2019	13:15:51	715	66.6	46	0.8
4/22/2019	13:16:51	724	66.8	46.1	0.8
4/22/2019	13:17:51	745	66.9	46.2	0.8
4/22/2019	13:18:51	747	67.1	46.1	0.8
4/22/2019	13:19:51	752	67.2	45.9	0.8
4/22/2019	13:20:51	750	67.3	46.1	0.8
4/22/2019	13:21:51	741	67.4	46	0.8
4/22/2019	13:22:51	742	67.5	45.9	0.8
4/22/2019	13:23:51	738	67.6	46.6	0.8
4/22/2019	13:24:51	736	67.6	47	0.8

4/22/2019	13:25:51	736	67.7	46.9	0.8
4/22/2019	13:26:51	736	67.7	47.3	0.8
4/22/2019	13:27:51	737	67.7	47.4	0.8
4/22/2019	13:28:51	736	67.8	47.5	0.8
4/22/2019	13:29:51	736	67.8	47.6	0.8
4/22/2019	13:30:51	735	67.8	47.8	0.8
4/22/2019	13:31:51	734	67.8	47.9	0.8
4/22/2019	13:32:51	734	67.8	48	0.8
4/22/2019	13:33:51	732	67.8	48	0.8
4/22/2019	13:34:50	714	67.1	44.7	0.8
4/22/2019	13:35:50	705	66.3	42.9	0.8
4/22/2019	13:36:50	703	65.6	41.9	0.9
4/22/2019	13:37:50	703	65	41.6	0.9
4/22/2019	13:38:50	701	65.1	41.9	0.9
4/22/2019	13:39:50	699	65.7	43.2	0.9
4/22/2019	13:40:50	696	65.9	43.9	0.8
4/22/2019	13:41:50	694	66.1	44	0.9
4/22/2019	13:42:50	694	66.3	44.1	0.9
4/22/2019	13:43:50	693	66.5	43.6	0.9
4/22/2019	13:44:50	693	66.7	43.6	0.8
4/22/2019	13:45:50	694	66.8	44	0.8
4/22/2019	13:46:50	693	67	44.3	0.8
4/22/2019	13:47:50	693	67.1	44.4	0.8
4/22/2019	13:48:50	693	67.2	44.3	0.8
4/22/2019	13:49:50	690	67.3	44.8	0.8
4/22/2019	13:50:50	690	67.4	44.7	0.8
4/22/2019	13:51:50	689	67.5	44.8	0.8
4/22/2019	13:52:50	687	67.6	45	0.8
4/22/2019	13:53:50	686	67.6	45	0.9
4/22/2019	13:54:50	683	67.7	45	0.8
4/22/2019	13:55:50	684	67.7	45.4	0.8
4/22/2019	13:56:50	683	67.8	45.5	0.9
4/22/2019	13:57:50	681	67.8	45.9	0.8
4/22/2019	13:58:50	679	67.8	45.6	0.8

4/22/2019	13:59:50	678	67.9	45.9	0.8
4/22/2019	14:00:50	677	67.8	45.7	0.8
4/22/2019	14:01:50	677	67.2	43.5	0.8
4/22/2019	14:02:50	683	66.3	42	0.9
4/22/2019	14:03:50	691	65.8	40.9	0.9
4/22/2019	14:04:50	695	65.2	40.7	0.9
4/22/2019	14:05:50	698	64.9	40.7	0.9
4/22/2019	14:06:50	697	65.4	41.7	0.8
4/22/2019	14:07:50	694	65.8	42.4	0.8
4/22/2019	14:08:50	692	66.1	42.8	0.8
4/22/2019	14:09:50	691	66.3	42.9	0.8
4/22/2019	14:10:50	691	66.5	42.9	0.8
4/22/2019	14:11:50	691	66.6	42.5	0.8
4/22/2019	14:12:50	692	66.8	42.7	0.8
4/22/2019	14:13:50	691	67	42.5	0.8
4/22/2019	14:14:50	692	67.1	42.8	0.8
4/22/2019	14:15:50	692	67.3	42.9	0.9
4/22/2019	14:16:50	691	67.4	42.9	0.8
4/22/2019	14:17:50	690	67.5	43.2	0.9
4/22/2019	14:18:50	690	67.6	43.4	0.8
4/22/2019	14:19:50	687	67.6	43.5	0.8
4/22/2019	14:20:50	687	67.7	43.6	0.8
4/22/2019	14:21:50	685	67.8	43.7	0.8
4/22/2019	14:22:50	683	67.8	43.8	0.8
4/22/2019	14:23:50	683	67.9	44	0.8
4/22/2019	14:24:50	682	67.9	44.3	0.8
4/22/2019	14:25:50	677	67.9	44.2	0.8
4/22/2019	14:26:50	675	67.8	43.5	0.9
4/22/2019	14:27:50	678	67.3	42.6	0.9
4/22/2019	14:28:50	683	67	42.4	0.9
4/22/2019	14:29:50	689	66.7	42.2	0.8
4/22/2019	14:30:50	699	65.9	41.4	0.8
4/22/2019	14:31:50	704	66.2	41.7	0.9
4/22/2019	14:32:50	704	66.6	42.4	0.8



4/22/2019	14:33:50	701	66.8	42.5	0.9
4/22/2019	14:34:50	699	66.9	42.6	0.9
4/22/2019	14:35:50	698	67.1	42.6	0.8
4/22/2019	14:36:50	705	67.3	42.4	0.8
4/22/2019	14:37:50	709	67.5	42.5	0.8
4/22/2019	14:38:50	713	67.7	42.4	0.8
4/22/2019	14:39:50	712	67.8	42.6	0.8
4/22/2019	14:40:50	707	67.9	42.9	0.8
4/22/2019	14:41:50	705	68	43	0.8
4/22/2019	14:42:50	706	68	43.4	0.9
4/22/2019	14:43:50	706	68.1	43.2	0.8
4/22/2019	14:44:50	707	68.1	43.4	0.8
4/22/2019	14:45:50	706	68.2	43.6	0.8
4/22/2019	14:46:49	702	67.7	42.9	0.8
4/22/2019	14:47:49	700	67.1	41.4	0.9
4/22/2019	14:48:49	704	66.4	41	0.9
4/22/2019	14:49:49	704	66.2	41.4	0.9
4/22/2019	14:50:49	705	66.1	41.8	0.8
4/22/2019	14:51:49	703	66.2	42	0.8
4/22/2019	14:52:49	700	66.7	42.3	0.8
4/22/2019	14:53:49	700	66.9	42.8	0.8
4/22/2019	14:54:49	701	67.1	42.6	0.8
4/22/2019	14:55:49	717	67.3	42.8	0.8
4/22/2019	14:56:49	728	67.5	42.9	0.8
4/22/2019	14:57:49	719	67.6	42.9	0.8
4/22/2019	14:58:49	715	67.7	42.8	0.8
4/22/2019	14:59:49	715	67.8	43.2	0.8
4/22/2019	15:00:49	712	67.9	43.1	0.8
4/22/2019	15:01:49	711	68	43.2	0.8
4/22/2019	15:02:49	711	68.1	43.1	0.8
4/22/2019	15:03:49	708	68.1	43.2	0.8
4/22/2019	15:04:49	706	68.2	43.3	0.8
4/22/2019	15:05:49	700	67.9	42.9	0.8
4/22/2019	15:06:49	697	67.7	42.4	0.8

4/22/2019	15:07:49	695	67.4	42.2	0.9
4/22/2019	15:08:49	693	67.3	42	0.9
4/22/2019	15:09:49	693	67.2	41.8	0.9
4/22/2019	15:10:49	692	66.8	41.7	0.9
4/22/2019	15:11:49	690	66.8	41.7	0.8
4/22/2019	15:12:49	689	67.1	42.2	0.8
4/22/2019	15:13:49	688	67.3	42.1	0.8
4/22/2019	15:14:49	687	67.4	42.2	0.8
4/22/2019	15:15:49	688	67.6	42.5	0.8
4/22/2019	15:16:49	689	67.7	42.5	0.8
4/22/2019	15:17:49	689	67.8	42.3	0.8
4/22/2019	15:18:49	688	67.9	42.4	0.8
4/22/2019	15:19:49	690	68	42.3	0.8
4/22/2019	15:20:49	689	68.1	42.4	0.8
4/22/2019	15:21:49	688	68.2	42.4	0.8
4/22/2019	15:22:49	685	67.6	41.4	0.8
4/22/2019	15:23:49	688	66.8	39.9	0.9
4/22/2019	15:24:49	693	66.3	39.1	0.9
4/22/2019	15:25:49	696	65.8	38.7	0.9
4/22/2019	15:26:49	698	65.3	38.6	0.9
4/22/2019	15:27:49	695	64.9	38.6	0.9
4/22/2019	15:28:49	693	65.5	39	0.9
4/22/2019	15:29:49	689	65.9	40	0.8
4/22/2019	15:30:49	688	66.3	40.5	0.8
4/22/2019	15:31:49	699	66.6	41.1	0.8
4/22/2019	15:32:49	725	66.9	41.1	0.8
4/22/2019	15:33:49	740	67.3	41	0.8
4/22/2019	15:34:49	729	67.5	40.7	0.8
4/22/2019	15:35:49	719	67.7	40.7	0.8
4/22/2019	15:36:49	719	67.8	40.8	0.8
4/22/2019	15:37:49	721	68	41.1	0.8
4/22/2019	15:38:49	716	68.1	41.2	0.8
4/22/2019	15:39:49	715	68.1	41.3	0.8
4/22/2019	15:40:49	715	67.6	39.8	0.8

4/22/2019	15:41:49	717	67.1	38.6	0.8
4/22/2019	15:42:49	708	66.7	39.1	0.8
4/22/2019	15:43:49	698	66.6	39.4	0.8
4/22/2019	15:44:49	690	66.3	39.6	0.8
4/22/2019	15:45:49	684	66.2	39.8	0.8
4/22/2019	15:46:49	678	66.3	39.9	0.8
4/22/2019	15:47:49	673	66.5	40	0.8
4/22/2019	15:48:49	672	66.8	40.2	0.8
4/22/2019	15:49:49	672	67	40.7	0.8
4/22/2019	15:50:49	672	67.2	40.7	0.8
4/22/2019	15:51:49	672	67.3	40.7	0.8
4/22/2019	15:52:49	672	67.5	40.6	0.7
4/22/2019	15:53:49	674	67.6	40.5	0.8
4/22/2019	15:54:49	672	67.8	40.9	0.8
4/22/2019	15:55:49	675	67.9	41	0.8
4/22/2019	15:56:49	675	68	40.7	0.8
4/22/2019	15:57:49	675	68.1	40.8	0.8
4/22/2019	15:58:48	673	68	40.5	0.8
4/22/2019	15:59:48	673	67.7	39.8	0.8
4/22/2019	16:00:48	673	67.1	39.8	0.8
4/22/2019	16:01:48	682	66.4	39.2	0.8
4/22/2019	16:02:48	713	65.7	38.5	0.8
4/22/2019	16:03:48	746	65.3	38.3	0.8
4/22/2019	16:04:48	774	64.8	38.1	0.8
4/22/2019	16:05:48	790	65.4	38.7	0.8
4/22/2019	16:06:48	788	66	39.6	0.8
4/22/2019	16:07:48	783	66.3	40.2	0.8
4/22/2019	16:08:48	777	66.5	40.1	0.8
4/22/2019	16:09:48	781	66.8	40.2	0.8
4/22/2019	16:10:48	780	67	40.1	0.8
4/22/2019	16:11:48	780	67.2	39.8	0.8
4/22/2019	16:12:48	780	67.4	39.6	0.7
4/22/2019	16:13:48	779	67.6	39.4	0.8
4/22/2019	16:14:48	779	67.7	39.4	0.8

4/22/2019	16:15:48	777	67.8	39.4	0.8
4/22/2019	16:16:48	775	67.9	39.5	0.8
4/22/2019	16:17:48	775	67.9	39.4	0.8
4/22/2019	16:18:48	829	67.3	38.6	0.8
4/22/2019	16:19:48	880	66.7	37.8	0.8
4/22/2019	16:20:48	908	66.2	38.1	0.9
4/22/2019	16:21:48	924	66.3	38.8	0.8
4/22/2019	16:22:48	936	66.2	39.1	0.9
4/22/2019	16:23:48	946	66	39.4	0.9
4/22/2019	16:24:48	952	66.5	39.6	0.8
4/22/2019	16:25:48	952	66.8	39.9	0.8
4/22/2019	16:26:48	949	67	40.1	0.8
4/22/2019	16:27:48	944	67.2	39.9	0.8
4/22/2019	16:28:48	942	67.4	40	0.8
4/22/2019	16:29:48	942	67.5	39.8	0.8
4/22/2019	16:30:48	940	67.7	39.7	0.8
4/22/2019	16:31:48	938	67.8	39.6	0.8
4/22/2019	16:32:48	934	67.9	39.7	0.8
4/22/2019	16:33:48	929	67.8	39	0.9
4/22/2019	16:34:48	931	67.4	38.5	1
4/22/2019	16:35:48	931	67.1	38.7	1.1
4/22/2019	16:36:48	928	66.8	38.9	1.3
4/22/2019	16:37:48	925	66.7	39	1.3
4/22/2019	16:38:48	922	66.5	39	1.4
4/22/2019	16:39:48	918	66.3	39.1	1.6
4/22/2019	16:40:48	913	66	39.1	1.5
4/22/2019	16:41:48	909	65.6	38.5	1.6
4/22/2019	16:42:48	908	66.2	38.8	1.5
4/22/2019	16:43:48	906	66.5	39.4	1.4
4/22/2019	16:44:48	901	66.7	39.4	1.4
4/22/2019	16:45:48	894	67	39.6	1.4
4/22/2019	16:46:48	895	67.2	39.5	1.4
4/22/2019	16:47:48	892	67.4	39.2	1.3
4/22/2019	16:48:48	892	67.5	39.3	1.4

4/22/2019	16:49:48	892	67.7	39.2	1.4
4/22/2019	16:50:48	890	67.8	39.2	1.4
4/22/2019	16:51:48	887	67.9	39.2	1.3
4/22/2019	16:52:48	897	67.5	38.6	1.5
4/22/2019	16:53:48	914	66.6	37.9	1.5
4/22/2019	16:54:48	930	65.9	37.3	1.6
4/22/2019	16:55:48	948	65.5	36.9	1.6
4/22/2019	16:56:48	969	64.9	36.8	1.6
4/22/2019	16:57:48	984	64.6	36.9	1.6
4/22/2019	16:58:48	991	64.9	37.2	1.5
4/22/2019	16:59:48	989	65.5	37.9	1.4
4/22/2019	17:00:48	981	65.9	38.4	1.3
4/22/2019	17:01:48	975	66.2	38.5	1.3
4/22/2019	17:02:48	970	66.5	38.6	1.3
4/22/2019	17:03:48	970	66.7	38.6	1.4
4/22/2019	17:04:48	970	67	38.5	1.3
4/22/2019	17:05:48	972	67.2	38.4	1.4
4/22/2019	17:06:48	970	67.3	38.3	1.4
4/22/2019	17:07:48	967	67.5	38.2	1.3
4/22/2019	17:08:48	963	67.6	38.1	1.4
4/22/2019	17:09:48	956	67.6	38.1	1.4
4/22/2019	17:10:47	952	66.9	37.5	1.6
4/22/2019	17:11:47	958	66.5	37	1.7
4/22/2019	17:12:47	958	66.1	37.4	1.8
4/22/2019	17:13:47	961	66.3	38.4	1.7
4/22/2019	17:14:47	967	66.3	38.9	1.7
4/22/2019	17:15:47	971	66.2	38.7	1.7
4/22/2019	17:16:47	967	66.1	38.8	1.8
4/22/2019	17:17:47	961	66.3	38.9	1.7
4/22/2019	17:18:47	959	66.6	39	1.7
4/22/2019	17:19:47	959	66.8	39.3	1.7
4/22/2019	17:20:47	954	67	39.3	1.7
4/22/2019	17:21:47	940	67.3	39.5	1.7
4/22/2019	17:22:47	934	67.4	39.6	1.7



4/22/2019	17:23:47	932	67.6	39.6	1.7
4/22/2019	17:24:47	936	67.8	39.5	1.7
4/22/2019	17:25:47	899	67.7	39.2	1.6
4/22/2019	17:26:47	883	67.3	39	1.6
4/22/2019	17:27:47	891	67.1	39.1	1.6
4/22/2019	17:28:47	896	67.1	39.1	1.6
4/22/2019	17:29:47	900	66.8	39.1	1.6
4/22/2019	17:30:47	903	66.5	39	1.7
4/22/2019	17:31:47	910	66.4	39.1	1.7
4/22/2019	17:32:47	911	66.2	39.1	1.7
4/22/2019	17:33:47	913	65.7	38.7	1.7
4/22/2019	17:34:47	917	65.2	38	1.7
4/22/2019	17:35:47	919	65.4	38	1.7
4/22/2019	17:36:47	915	66.1	38.5	1.7
4/22/2019	17:37:47	897	66.3	39.2	1.6
4/22/2019	17:38:47	902	66.6	39.4	1.6
4/22/2019	17:39:47	893	66.8	39.5	1.5
4/22/2019	17:40:47	880	67.1	39.4	1.6
4/22/2019	17:41:47	864	67.3	39.3	1.5
4/22/2019	17:42:47	862	67.5	39.3	1.4
4/22/2019	17:43:47	861	67.7	39.3	1.5
4/22/2019	17:44:47	850	67.6	39.2	1.4
4/22/2019	17:45:47	841	67.2	39	1.5
4/22/2019	17:46:47	847	66.6	38.6	1.5
4/22/2019	17:47:47	862	65.8	37.8	1.6
4/22/2019	17:48:47	872	65.3	37.3	1.6
4/22/2019	17:49:47	880	64.7	37.2	1.6
4/22/2019	17:50:47	889	64.5	37.1	1.5
4/22/2019	17:51:47	895	64.3	37.2	1.5
4/22/2019	17:52:47	896	65	37.5	1.4
4/22/2019	17:53:47	883	65.5	38.3	1.2
4/22/2019	17:54:47	869	65.9	38.8	1.1
4/22/2019	17:55:47	857	66.2	39.1	1
4/22/2019	17:56:47	836	66.5	39.4	1

4/22/2019	17:57:47	814	66.8	39.6	1
4/22/2019	17:58:47	800	67	39.8	1
4/22/2019	17:59:47	803	67.1	39.1	0.9
4/22/2019	18:00:47	810	66.4	37.3	1
4/22/2019	18:01:47	831	65.7	36.6	1
4/22/2019	18:02:47	847	65.2	36.4	1.2
4/22/2019	18:03:47	863	64.6	36.2	1.1
4/22/2019	18:04:47	872	64.4	36.4	1.1
4/22/2019	18:05:47	875	64.7	37.2	1.1
4/22/2019	18:06:47	876	64.9	37.7	1
4/22/2019	18:07:47	877	65.2	37.9	1
4/22/2019	18:08:47	875	65.6	38.1	0.9
4/22/2019	18:09:47	876	65.8	38.5	1
4/22/2019	18:10:47	872	66.1	38.6	1
4/22/2019	18:11:47	868	66.3	38.6	1
4/22/2019	18:12:47	870	66.6	38.5	0.9
4/22/2019	18:13:47	871	66.8	38.2	1
4/22/2019	18:14:47	872	67	38.1	1
4/22/2019	18:15:47	872	67.2	38	1.1
4/22/2019	18:16:47	870	66.9	37.2	1
4/22/2019	18:17:47	872	66.2	36.2	1.1
4/22/2019	18:18:47	876	65.9	36.6	1.1
4/22/2019	18:19:47	879	65.8	37.1	1.1
4/22/2019	18:20:47	878	65.8	37.4	1
4/22/2019	18:21:46	879	65.7	37.5	1
4/22/2019	18:22:46	880	65.7	37.7	0.9
4/22/2019	18:23:46	879	65.6	37.8	1
4/22/2019	18:24:46	877	65.4	37.9	1
4/22/2019	18:25:46	877	65.7	38	1
4/22/2019	18:26:46	876	66	38.2	0.9
4/22/2019	18:27:46	873	66.2	38.4	0.9
4/22/2019	18:28:46	872	66.5	38.3	0.9
4/22/2019	18:29:46	872	66.7	38.2	0.9
4/22/2019	18:30:46	869	66.9	38.1	0.8

4/22/2019	18:31:46	867	67	37.9	0.9
4/22/2019	18:32:46	869	67.2	37.9	0.9
4/22/2019	18:33:46	869	67.3	37.9	0.9
4/22/2019	18:34:46	865	67.3	37.7	1
4/22/2019	18:35:46	862	67	37.3	0.9
4/22/2019	18:36:46	866	66.4	37	1
4/22/2019	18:37:46	872	65.7	36.4	1
4/22/2019	18:38:46	879	65	36	1
4/22/2019	18:39:46	886	64.5	35.7	1
4/22/2019	18:40:46	892	64	35.9	0.9
4/22/2019	18:41:46	900	64.2	36	0.9
4/22/2019	18:42:46	896	65	36.7	0.9
4/22/2019	18:43:46	892	65.3	37.3	0.8
4/22/2019	18:44:46	889	65.7	37.4	0.8
4/22/2019	18:45:46	889	65.9	37.4	0.9
4/22/2019	18:46:46	889	66.2	37.4	0.9
4/22/2019	18:47:46	886	66.5	37.2	0.9
4/22/2019	18:48:46	886	66.6	37.1	0.9
4/22/2019	18:49:46	886	66.8	37	0.9
4/22/2019	18:50:46	885	67	36.9	0.9
4/22/2019	18:51:46	884	67.2	36.9	0.9
4/22/2019	18:52:46	885	67.2	37	0.9
4/22/2019	18:53:46	906	66.5	36.4	0.9
4/22/2019	18:54:46	934	65.8	35.9	0.9
4/22/2019	18:55:46	953	65.5	35.9	1
4/22/2019	18:56:46	962	65.3	36.7	1
4/22/2019	18:57:46	969	65.4	37.1	0.9
4/22/2019	18:58:46	976	65.2	37.4	0.9
4/22/2019	18:59:46	979	65.2	37.7	1
4/22/2019	19:00:46	979	65.7	37.9	0.9
4/22/2019	19:01:46	976	66	38.2	0.9
4/22/2019	19:02:46	970	66.2	38.2	0.9
4/22/2019	19:03:46	966	66.4	38.3	0.8
4/22/2019	19:04:46	961	66.6	38.3	0.8

4/22/2019	19:05:46	961	66.8	38.3	0.9
4/22/2019	19:06:46	961	66.9	38.1	0.9
4/22/2019	19:07:46	960	67.1	37.9	0.8
4/22/2019	19:08:46	959	67.2	37.8	0.9
4/22/2019	19:09:46	959	67.3	37.7	0.9
4/22/2019	19:10:46	957	67.4	37.8	0.9
4/22/2019	19:11:46	961	67.3	38	0.9
4/22/2019	19:12:46	973	66.8	37.9	0.9
4/22/2019	19:13:46	985	66.4	37.9	1
4/22/2019	19:14:46	994	66.3	38	0.9
4/22/2019	19:15:46	997	66	38.3	0.9
4/22/2019	19:16:46	999	65.8	38.3	0.9
4/22/2019	19:17:46	1005	65.5	38.4	0.9
4/22/2019	19:18:46	1010	65.3	38.2	1
4/22/2019	19:19:46	1011	65.8	38.5	0.8
4/22/2019	19:20:46	1008	66	38.8	0.9
4/22/2019	19:21:46	999	66.2	38.8	0.8
4/22/2019	19:22:46	993	66.4	38.7	0.8
4/22/2019	19:23:46	992	66.6	38.7	0.8
4/22/2019	19:24:46	991	66.8	38.6	0.8
4/22/2019	19:25:46	988	67	38.4	0.9
4/22/2019	19:26:46	989	67.1	38.4	0.8
4/22/2019	19:27:46	987	67.2	38.3	0.8
4/22/2019	19:28:46	979	66.9	37.9	0.8
4/22/2019	19:29:46	974	66.3	37.5	0.9
4/22/2019	19:30:46	971	65.5	36.8	1
4/22/2019	19:31:46	970	64.8	36.2	1
4/22/2019	19:32:46	967	64.3	36	1
4/22/2019	19:33:46	962	63.8	35.9	0.9
4/22/2019	19:34:45	954	63.6	35.8	0.9
4/22/2019	19:35:45	947	64.2	36.3	0.9
4/22/2019	19:36:45	945	64.6	37.1	0.9
4/22/2019	19:37:45	943	65.1	37.4	0.9
4/22/2019	19:38:45	939	65.4	37.5	0.9

4/22/2019	19:39:45	937	65.6	37.6	0.8
4/22/2019	19:40:45	933	65.9	37.6	0.8
4/22/2019	19:41:45	928	66.1	37.6	0.8
4/22/2019	19:42:45	928	66.3	37.4	0.9
4/22/2019	19:43:45	928	66.5	37.3	0.8
4/22/2019	19:44:45	928	66.7	37.2	0.9
4/22/2019	19:45:45	928	66.8	37.1	0.8
4/22/2019	19:46:45	924	66.9	36.9	0.8
4/22/2019	19:47:45	912	66.1	35.5	0.9
4/22/2019	19:48:45	911	65.6	35.4	0.9
4/22/2019	19:49:45	910	65.3	36	0.9
4/22/2019	19:50:45	908	65.2	36.5	0.9
4/22/2019	19:51:45	906	65	36.7	0.9
4/22/2019	19:52:45	900	64.9	36.9	1
4/22/2019	19:53:45	899	64.8	37.1	0.9
4/22/2019	19:54:45	895	65.3	37.2	0.9
4/22/2019	19:55:45	895	65.6	37.5	0.8
4/22/2019	19:56:45	893	65.8	37.8	0.8
4/22/2019	19:57:45	893	66	37.8	0.9
4/22/2019	19:58:45	892	66.2	37.7	0.9
4/22/2019	19:59:45	890	66.4	37.6	0.9
4/22/2019	20:00:45	889	66.5	37.5	0.9
4/22/2019	20:01:45	889	66.7	37.4	0.8
4/22/2019	20:02:45	888	66.8	37.3	0.9
4/22/2019	20:03:45	887	67	37.3	0.9
4/22/2019	20:04:45	888	67.1	37.2	0.9
4/22/2019	20:05:45	887	67	37.2	0.9
4/22/2019	20:06:45	865	66.6	36.8	0.9
4/22/2019	20:07:45	859	66.2	36.7	0.9
4/22/2019	20:08:45	852	65.5	36.5	0.9
4/22/2019	20:09:45	847	64.8	36	1
4/22/2019	20:10:45	840	64.1	35.6	0.9
4/22/2019	20:11:45	834	63.7	35.3	1
4/22/2019	20:12:45	830	64.2	35.9	0.9



4/22/2019	20:13:45	826	64.8	36.6	0.9
4/22/2019	20:14:45	826	65.1	36.9	0.9
4/22/2019	20:15:45	824	65.3	37	0.9
4/22/2019	20:16:45	823	65.6	37.3	0.8
4/22/2019	20:17:45	822	65.8	37.2	0.9
4/22/2019	20:18:45	819	66.1	37.2	0.8
4/22/2019	20:19:45	813	66.3	37.3	0.9
4/22/2019	20:20:45	806	66.4	37.3	0.9
4/22/2019	20:21:45	801	66.6	37.4	0.9
4/22/2019	20:22:45	814	66.7	38.1	0.9
4/22/2019	20:23:45	818	66.8	38.3	0.9
4/22/2019	20:24:45	812	66.9	38.3	0.8
4/22/2019	20:25:45	812	66.8	37.7	0.9
4/22/2019	20:26:45	827	65.9	36.6	0.9
4/22/2019	20:27:45	860	65	35.7	1
4/22/2019	20:28:45	890	64.5	35.5	1
4/22/2019	20:29:45	905	64.2	36.3	0.9
4/22/2019	20:30:45	918	64.3	37	0.9
4/22/2019	20:31:45	926	64.6	37.4	0.9
4/22/2019	20:32:45	928	65.1	37.6	0.9
4/22/2019	20:33:45	923	65.4	37.9	0.9
4/22/2019	20:34:45	918	65.6	38.1	0.8
4/22/2019	20:35:45	914	65.8	38.2	0.8
4/22/2019	20:36:45	910	66.1	38.3	0.9
4/22/2019	20:37:45	909	66.2	38.2	0.8
4/22/2019	20:38:45	905	66.4	38.3	0.8
4/22/2019	20:39:45	907	66.5	38.1	1
4/22/2019	20:40:45	908	66.6	37.9	0.9
4/22/2019	20:41:45	906	66.7	37.9	0.9
4/22/2019	20:42:45	904	66.8	37.8	0.9
4/22/2019	20:43:45	901	66.9	37.8	0.9
4/22/2019	20:44:45	897	67	37.9	0.8
4/22/2019	20:45:45	893	67	38.1	0.9
4/22/2019	20:46:45	917	66.5	37.7	0.9

4/22/2019	20:47:44	944	65.9	37.5	1
4/22/2019	20:48:44	973	65.1	36.8	1
4/22/2019	20:49:44	997	64.3	36.3	1
4/22/2019	20:50:44	1014	64	36.2	1.1
4/22/2019	20:51:44	1025	64	36.1	1
4/22/2019	20:52:44	1021	64.7	36.9	0.9
4/22/2019	20:53:44	1010	65	37.3	0.9
4/22/2019	20:54:44	1003	65.3	37.4	0.9
4/22/2019	20:55:44	994	65.5	37.6	0.9
4/22/2019	20:56:44	988	65.8	37.6	0.9
4/22/2019	20:57:44	987	65.9	37.6	0.9
4/22/2019	20:58:44	984	66.1	37.5	0.8
4/22/2019	20:59:44	984	66.3	37.5	0.9
4/22/2019	21:00:44	979	66.4	37.5	0.9
4/22/2019	21:01:44	974	66.5	37.6	0.9
4/22/2019	21:02:44	975	66.6	37.5	0.9
4/22/2019	21:03:44	970	66.7	37.6	0.9
4/22/2019	21:04:44	964	66.8	37.7	0.9
4/22/2019	21:05:44	957	66.9	37.8	0.8
4/22/2019	21:06:44	949	67	37.9	0.8
4/22/2019	21:07:44	943	67	38	0.9
4/22/2019	21:08:44	936	67.1	38.2	0.8
4/22/2019	21:09:44	944	66.8	38.1	0.9
4/22/2019	21:10:44	956	66.3	37.9	0.8
4/22/2019	21:11:44	968	65.7	37.8	0.9
4/22/2019	21:12:44	974	65.4	37.8	0.9
4/22/2019	21:13:44	980	65.1	37.9	0.9
4/22/2019	21:14:44	983	65.5	38.2	0.9
4/22/2019	21:15:44	982	65.9	38.5	0.9
4/22/2019	21:16:44	977	66	38.6	0.8
4/22/2019	21:17:44	973	66.2	38.6	0.8
4/22/2019	21:18:44	971	66.3	38.6	0.9
4/22/2019	21:19:44	966	66.5	38.6	0.8
4/22/2019	21:20:44	963	66.6	38.4	0.9

4/22/2019	21:21:44	960	66.7	38.9	0.8
4/22/2019	21:22:44	957	66.8	38.8	0.9
4/22/2019	21:23:44	958	66.9	38.5	0.8
4/22/2019	21:24:44	955	66.9	38.6	0.8
4/22/2019	21:25:44	954	67	38.5	0.9
4/22/2019	21:26:44	943	66.9	38.8	0.8
4/22/2019	21:27:44	945	66.1	37.7	0.9
4/22/2019	21:28:44	955	65.2	36.7	0.9
4/22/2019	21:29:44	964	64.4	36	0.9
4/22/2019	21:30:44	971	64	35.7	0.9
4/22/2019	21:31:44	975	63.4	35.7	0.9
4/22/2019	21:32:44	974	64	36.2	0.9
4/22/2019	21:33:44	970	64.5	37	0.9
4/22/2019	21:34:44	962	64.9	37.3	0.8
4/22/2019	21:35:44	955	65.2	37.5	0.9
4/22/2019	21:36:44	953	65.4	37.7	0.8
4/22/2019	21:37:44	950	65.6	37.6	0.9
4/22/2019	21:38:44	947	65.8	37.6	0.8
4/22/2019	21:39:44	945	65.9	37.6	0.8
4/22/2019	21:40:44	941	66.1	37.5	0.8
4/22/2019	21:41:44	930	66.2	38.2	0.8
4/22/2019	21:42:44	935	66.4	38	0.8
4/22/2019	21:43:44	934	66.5	38.6	0.7
4/22/2019	21:44:44	933	66.6	38	0.8
4/22/2019	21:45:44	932	66.6	38	0.8
4/22/2019	21:46:44	923	66.7	39.9	0.7
4/22/2019	21:47:44	919	66.8	39.7	0.7
4/22/2019	21:48:44	921	66.7	38.7	0.8
4/22/2019	21:49:44	930	66.7	38.5	0.9
4/22/2019	21:50:44	950	66.3	38.3	1
4/22/2019	21:51:44	953	65.8	38	0.9
4/22/2019	21:52:44	951	65.4	37.9	0.9
4/22/2019	21:53:44	950	65.1	38	0.9
4/22/2019	21:54:44	953	65	38.1	0.9

4/22/2019	21:55:44	955	65.4	38.3	0.8
4/22/2019	21:56:44	954	65.5	38.7	0.9
4/22/2019	21:57:44	951	65.7	38.8	0.9
4/22/2019	21:58:44	946	65.9	38.8	0.9
4/22/2019	21:59:44	941	66.1	38.8	0.8
4/22/2019	22:00:43	939	66.2	38.8	0.8
4/22/2019	22:01:43	938	66.3	38.8	0.8
4/22/2019	22:02:43	936	66.4	38.9	0.8
4/22/2019	22:03:43	937	66.5	39	0.8
4/22/2019	22:04:43	933	66.6	39.2	0.8
4/22/2019	22:05:43	932	66.7	38.9	0.8
4/22/2019	22:06:43	932	66.7	38.9	0.8
4/22/2019	22:07:43	930	66.8	38.9	0.8
4/22/2019	22:08:43	926	66.8	39	0.8
4/22/2019	22:09:43	937	65.9	37.6	0.9
4/22/2019	22:10:43	967	65.1	36.8	1.1
4/22/2019	22:11:43	997	64.4	36.6	1.3
4/22/2019	22:12:43	1032	64.5	37.6	1.2
4/22/2019	22:13:43	1068	64.2	37.3	1.2
4/22/2019	22:14:43	1073	64.5	37	1.3
4/22/2019	22:15:43	1089	64.8	37.7	1.3
4/22/2019	22:16:43	1086	65	37.8	1.4
4/22/2019	22:17:43	1077	65.2	38.4	1.3
4/22/2019	22:18:43	1059	65.4	38.5	1.2
4/22/2019	22:19:43	1047	65.6	38.9	1.3
4/22/2019	22:20:43	1038	65.8	38.9	1.1
4/22/2019	22:21:43	1037	65.9	39.1	1.2
4/22/2019	22:22:43	1033	66	39.9	0.9
4/22/2019	22:23:43	1027	66.2	40.1	1
4/22/2019	22:24:43	1020	66.3	39.9	1.1
4/22/2019	22:25:43	1018	66.4	40.1	1
4/22/2019	22:26:43	1024	66.5	39.7	1.2
4/22/2019	22:27:43	1022	66.5	39.8	1
4/22/2019	22:28:43	1018	66.6	39.8	1.1

4/22/2019	22:29:43	1006	66.7	40	1
4/22/2019	22:30:43	1004	66.7	39.9	1.1
4/22/2019	22:31:43	1002	66.8	39.9	1
4/22/2019	22:32:43	977	66.4	39.2	1.1
4/22/2019	22:33:43	972	65.7	38.7	1.1
4/22/2019	22:34:43	969	65.2	38.7	1.1
4/22/2019	22:35:43	965	64.7	38.6	1.2
4/22/2019	22:36:43	963	64.1	38	1.1
4/22/2019	22:37:43	959	63.5	37.5	1.2
4/22/2019	22:38:43	953	64.1	37.8	1.1
4/22/2019	22:39:43	951	64.6	38.6	0.9
4/22/2019	22:40:43	946	64.9	38.8	0.9
4/22/2019	22:41:43	941	65.1	39	0.9
4/22/2019	22:42:43	936	65.3	39.1	0.9
4/22/2019	22:43:43	933	65.5	39.1	0.9
4/22/2019	22:44:43	913	65.6	39.8	0.9
4/22/2019	22:45:43	917	65.8	39.4	1
4/22/2019	22:46:43	927	65.9	39.3	1
4/22/2019	22:47:43	930	66.1	39.3	0.9
4/22/2019	22:48:43	927	66.1	39.3	0.9
4/22/2019	22:49:43	930	66.3	39.3	0.9
4/22/2019	22:50:43	928	66.4	39.4	0.9
4/22/2019	22:51:43	923	66.4	39.4	0.9
4/22/2019	22:52:43	914	66.5	39.5	0.9
4/22/2019	22:53:43	917	66.6	39.6	0.9
4/22/2019	22:54:43	930	66.7	40	0.9
4/22/2019	22:55:43	921	66.7	39.9	0.9
4/22/2019	22:56:43	916	66.8	40	0.9
4/22/2019	22:57:43	911	66.8	39.8	0.9
4/22/2019	22:58:43	923	66.4	39.4	0.9
4/22/2019	22:59:43	960	66	39	0.9
4/22/2019	23:00:43	974	65.8	39.2	0.9
4/22/2019	23:01:43	979	65.6	39.1	0.9
4/22/2019	23:02:43	998	65.3	39.1	0.9



4/22/2019	23:03:43	1003	65.6	39.6	0.9
4/22/2019	23:04:43	1005	65.8	39.8	0.9
4/22/2019	23:05:43	1017	65.9	39.8	0.9
4/22/2019	23:06:43	1020	66	40.4	0.8
4/22/2019	23:07:43	975	66.1	40.2	0.9
4/22/2019	23:08:43	1037	66.3	40.1	0.8
4/22/2019	23:09:43	1054	66.4	39.8	0.8
4/22/2019	23:10:43	1068	66.5	39.9	0.9
4/22/2019	23:11:43	1074	66.6	39.9	0.8
4/22/2019	23:12:43	1107	66.7	40	0.9
4/22/2019	23:13:42	1107	66.8	40	0.9
4/22/2019	23:14:42	1114	66.8	40	1.2
4/22/2019	23:15:42	1120	66.9	40.2	1.3
4/22/2019	23:16:42	1111	67	40.5	1.5
4/22/2019	23:17:42	1113	67	40.4	1.6
4/22/2019	23:18:42	1115	67.1	40.6	1.4
4/22/2019	23:19:42	1128	66.9	40.5	1.6
4/22/2019	23:20:42	1127	66.3	39.1	1.6
4/22/2019	23:21:42	1117	65.6	38.2	1.6
4/22/2019	23:22:42	1098	64.6	37.6	1.5
4/22/2019	23:23:42	1077	64.1	37.3	1.4
4/22/2019	23:24:42	1057	63.9	37.3	1.2
4/22/2019	23:25:42	1075	64.3	38.1	1
4/22/2019	23:26:42	1053	64.6	38.8	1
4/22/2019	23:27:42	1049	64.8	38.6	1
4/22/2019	23:28:42	1049	65	38.7	1
4/22/2019	23:29:42	1036	65.2	40.1	0.9
4/22/2019	23:30:42	1056	65.4	40.2	0.9
4/22/2019	23:31:42	1079	65.5	39.5	0.9
4/22/2019	23:32:42	1089	65.7	39.5	0.9
4/22/2019	23:33:42	1098	65.8	39	1
4/22/2019	23:34:42	1110	65.9	38.9	1
4/22/2019	23:35:42	1119	66.1	38.8	1
4/22/2019	23:36:42	1132	66.2	38.8	1

4/22/2019	23:37:42	1139	66.3	38.9	1
4/22/2019	23:38:42	1147	66.4	38.9	1
4/22/2019	23:39:42	1148	66.5	39.1	1
4/22/2019	23:40:42	1148	66.6	39.3	1.1
4/22/2019	23:41:42	1187	66.6	39.4	1.3
4/22/2019	23:42:42	1200	66.7	39.6	1.4
4/22/2019	23:43:42	1204	66.8	39.6	1.5
4/22/2019	23:44:42	1175	66.4	39	1.3
4/22/2019	23:45:42	1155	65.7	37.5	1.5
4/22/2019	23:46:42	1130	64.8	36.8	1.4
4/22/2019	23:47:42	1102	64.2	36.5	1.2
4/22/2019	23:48:42	1071	63.8	36.5	1.1
4/22/2019	23:49:42	1078	64.1	37.3	1
4/22/2019	23:50:42	1069	64.3	37.7	0.9
4/22/2019	23:51:42	1051	64.6	37.8	0.9
4/22/2019	23:52:42	1052	64.8	37.9	0.9
4/22/2019	23:53:42	1059	65	38.7	0.9
4/22/2019	23:54:42	1052	65.1	39.5	0.9
4/22/2019	23:55:42	1026	65.3	39.8	0.9
4/22/2019	23:56:42	1045	65.4	39.6	0.9
4/22/2019	23:57:42	1092	65.6	39.5	0.9
4/22/2019	23:58:42	1105	65.7	39.6	0.9
4/22/2019	23:59:42	1143	65.8	39.4	0.9
4/23/2019	0:00:42	1145	65.9	39.7	0.8
4/23/2019	0:01:42	1129	66	39.5	0.9
4/23/2019	0:02:42	1139	66.1	39.4	0.9
4/23/2019	0:03:42	1128	66.2	39.6	0.9
4/23/2019	0:04:42	1151	66.3	39.3	0.9
4/23/2019	0:05:42	1142	66.4	39.5	0.9
4/23/2019	0:06:42	1141	66.4	39.7	1.1
4/23/2019	0:07:42	1155	66.5	39.6	1
4/23/2019	0:08:42	1186	66.5	39.4	1.1
4/23/2019	0:09:42	1185	66.6	39.7	1.1
4/23/2019	0:10:42	1176	66.7	39.9	1.1

4/23/2019	0:11:42	1197	66.7	39.9	1.1
4/23/2019	0:12:42	1215	66.7	40.1	1.2
4/23/2019	0:13:42	1221	66.7	40.1	1
4/23/2019	0:14:42	1181	66	39.2	1.1
4/23/2019	0:15:42	1137	65.2	38.4	1.1
4/23/2019	0:16:42	1091	64.2	37.6	1
4/23/2019	0:17:42	1042	63.3	36.8	0.9
4/23/2019	0:18:42	1005	62.8	37.6	0.8
4/23/2019	0:19:42	998	63.3	38.7	0.8
4/23/2019	0:20:42	987	63.5	39.4	0.8
4/23/2019	0:21:42	988	63.9	40	0.7
4/23/2019	0:22:42	983	64.1	39.7	0.8
4/23/2019	0:23:42	978	64.4	39.9	0.8
4/23/2019	0:24:42	977	64.6	40.2	0.7
4/23/2019	0:25:42	945	64.8	40.7	0.8
4/23/2019	0:26:42	994	64.9	40	0.8
4/23/2019	0:27:41	1016	65.1	39.9	0.8
4/23/2019	0:28:41	1027	65.2	39.8	0.8
4/23/2019	0:29:41	1033	65.4	39.8	0.8
4/23/2019	0:30:41	1035	65.5	39.9	0.8
4/23/2019	0:31:41	1030	65.6	40	0.8
4/23/2019	0:32:41	1039	65.7	40	0.8
4/23/2019	0:33:41	1039	65.7	40.1	0.7
4/23/2019	0:34:41	1046	65.8	40.3	0.8
4/23/2019	0:35:41	1058	65.9	40.4	0.8
4/23/2019	0:36:41	1067	65.9	40.3	0.8
4/23/2019	0:37:41	1083	66	40.3	0.8
4/23/2019	0:38:41	1089	66.1	40.4	0.7
4/23/2019	0:39:41	1076	66.1	40.6	0.8
4/23/2019	0:40:41	1084	66.2	40.7	0.8
4/23/2019	0:41:41	1107	66.2	40.6	0.8
4/23/2019	0:42:41	1119	66.3	40.7	0.8
4/23/2019	0:43:41	1126	66.3	40.8	0.8
4/23/2019	0:44:41	1104	66.3	40.9	0.7

4/23/2019	0:45:41	1093	66.4	41.1	0.7
4/23/2019	0:46:41	1117	66.4	41.2	0.8
4/23/2019	0:47:41	1138	66.4	41.3	0.8
4/23/2019	0:48:41	1152	66.5	41.4	0.8
4/23/2019	0:49:41	1161	66.5	41.4	0.8
4/23/2019	0:50:41	1176	66.6	41.9	0.8
4/23/2019	0:51:41	1131	66.7	42.3	0.8
4/23/2019	0:52:41	1120	66.8	42.7	0.8
4/23/2019	0:53:41	1113	66.8	42.5	0.8
4/23/2019	0:54:41	1088	66.9	42.5	0.9
4/23/2019	0:55:41	1111	66.9	42.6	0.8
4/23/2019	0:56:41	1143	66.9	42.8	0.9
4/23/2019	0:57:41	1145	66.9	43	0.9
4/23/2019	0:58:41	1167	67	43.1	0.9
4/23/2019	0:59:41	1171	67	43.1	0.9
4/23/2019	1:00:41	1179	67	43.2	0.9
4/23/2019	1:01:41	1199	67	43.4	1
4/23/2019	1:02:41	1185	67	43.4	0.9
4/23/2019	1:03:41	1127	67	43.1	0.9
4/23/2019	1:04:41	1137	67	43.2	0.9
4/23/2019	1:05:41	1139	67	43.2	0.9
4/23/2019	1:06:41	1142	67	43.1	0.9
4/23/2019	1:07:41	1149	67	43.1	0.9
4/23/2019	1:08:41	1155	67	43	0.9
4/23/2019	1:09:41	1158	67	43	0.9
4/23/2019	1:10:41	1153	67	42.9	0.8
4/23/2019	1:11:41	1147	67	42.8	0.8
4/23/2019	1:12:41	1156	67	42.9	0.8
4/23/2019	1:13:41	1168	67.1	43.1	0.8
4/23/2019	1:14:41	1171	67.1	43.1	0.8
4/23/2019	1:15:41	1178	67.1	43.2	0.9
4/23/2019	1:16:41	1156	67.1	43	0.8
4/23/2019	1:17:41	1152	67	43.1	0.8
4/23/2019	1:18:41	1151	67	43.2	0.8

4/23/2019	1:19:41	1172	67	43.2	0.8
4/23/2019	1:20:41	1168	67	43.2	0.9
4/23/2019	1:21:41	1180	67	43.2	0.9
4/23/2019	1:22:41	1200	67	43.2	0.9
4/23/2019	1:23:41	1210	67	43.3	0.9
4/23/2019	1:24:41	1219	67	43.5	0.9
4/23/2019	1:25:41	1232	67.1	43.8	0.9
4/23/2019	1:26:41	1250	67.1	44	0.9
4/23/2019	1:27:41	1282	67.1	44.2	0.8
4/23/2019	1:28:41	1298	67.1	44.3	0.9
4/23/2019	1:29:41	1230	67.1	43.9	0.9
4/23/2019	1:30:41	1244	67.1	44.2	0.9
4/23/2019	1:31:41	1253	67.2	44.2	0.8
4/23/2019	1:32:41	1252	67.2	44.2	0.8
4/23/2019	1:33:41	1255	67.2	44.2	0.8
4/23/2019	1:34:41	1249	67.2	44.2	0.9
4/23/2019	1:35:41	1253	67.2	44.1	0.9
4/23/2019	1:36:41	1245	67.2	44.2	0.8
4/23/2019	1:37:41	1249	67.2	44.1	0.8
4/23/2019	1:38:41	1262	67.2	44	0.8
4/23/2019	1:39:41	1297	67.2	44.3	0.9
4/23/2019	1:40:40	1322	67.2	44.6	0.8
4/23/2019	1:41:40	1320	67.2	44.6	0.8
4/23/2019	1:42:40	1349	67.3	44.8	0.8
4/23/2019	1:43:40	1332	67.2	44.7	0.8
4/23/2019	1:44:40	1258	67.2	44.5	0.8
4/23/2019	1:45:40	1255	67.2	44.6	0.8
4/23/2019	1:46:40	1260	67.2	44.6	0.8
4/23/2019	1:47:40	1263	67.2	44.7	0.8
4/23/2019	1:48:40	1274	67.3	44.7	0.8
4/23/2019	1:49:40	1272	67.3	44.7	0.8
4/23/2019	1:50:40	1286	67.3	44.9	0.8
4/23/2019	1:51:40	1310	67.3	45.1	0.8
4/23/2019	1:52:40	1330	67.3	45.3	0.8



4/23/2019	1:53:40	1353	67.3	45.4	0.8
4/23/2019	1:54:40	1375	67.3	45.7	0.8
4/23/2019	1:55:40	1387	67.3	45.7	0.8
4/23/2019	1:56:40	1363	67.3	45.7	1
4/23/2019	1:57:40	1322	67.4	45.3	0.9
4/23/2019	1:58:40	1301	67.3	45.4	1.1
4/23/2019	1:59:40	1286	67.3	45.5	1
4/23/2019	2:00:40	1299	67.4	45.5	1
4/23/2019	2:01:40	1317	67.4	45.7	1.2
4/23/2019	2:02:40	1320	67.4	45.5	1.1
4/23/2019	2:03:40	1331	67.4	45.6	0.9
4/23/2019	2:04:40	1349	67.4	45.9	1
4/23/2019	2:05:40	1363	67.5	46.5	0.9
4/23/2019	2:06:40	1369	67.5	46.8	0.9
4/23/2019	2:07:40	1326	67.5	46.7	0.8
4/23/2019	2:08:40	1290	67.6	46.6	0.9
4/23/2019	2:09:40	1256	67.5	46.7	0.8
4/23/2019	2:10:40	1219	67.5	46.7	0.8
4/23/2019	2:11:40	1097	67.5	47.2	0.7
4/23/2019	2:12:40	1071	67.5	47.1	0.6
4/23/2019	2:13:40	1082	67.4	47	0.6
4/23/2019	2:14:40	1085	67.4	47	0.7
4/23/2019	2:15:40	1076	67.4	46.9	0.7
4/23/2019	2:16:40	1069	67.4	46.8	0.6
4/23/2019	2:17:40	1052	67.4	46.8	0.5
4/23/2019	2:18:40	1044	67.4	46.8	0.6
4/23/2019	2:19:40	1026	67.4	46.8	0.5
4/23/2019	2:20:40	1020	67.4	46.9	0.4
4/23/2019	2:21:40	1006	67.4	46.9	0.3
4/23/2019	2:22:40	984	67.4	46.9	0.4
4/23/2019	2:23:40	967	67.4	47	0.3
4/23/2019	2:24:40	943	67.4	47	0.3
4/23/2019	2:25:40	864	67.3	47.4	0.1
4/23/2019	2:26:40	808	67.3	47.6	0

4/23/2019	2:27:40	801	67.3	47.8	0
4/23/2019	2:28:40	805	67.3	47.7	0.1
4/23/2019	2:29:40	804	67.3	47.7	0
4/23/2019	2:30:40	799	67.3	47.7	0
4/23/2019	2:31:40	794	67.3	47.6	0.1
4/23/2019	2:32:40	790	67.3	47.6	0.1
4/23/2019	2:33:40	779	67.3	47.6	0
4/23/2019	2:34:40	771	67.3	47.6	0
4/23/2019	2:35:40	764	67.3	47.6	0
4/23/2019	2:36:40	755	67.3	47.7	0
4/23/2019	2:37:40	749	67.2	47.7	0
4/23/2019	2:38:40	739	67.2	47.7	0
4/23/2019	2:39:40	709	67.2	47.8	0
4/23/2019	2:40:40	669	67.2	48.1	0
4/23/2019	2:41:40	657	67.2	48.3	0
4/23/2019	2:42:40	658	67.2	48.4	0
4/23/2019	2:43:40	686	67.2	48.4	0
4/23/2019	2:44:40	760	67.3	48.8	0
4/23/2019	2:45:40	776	67.4	48.8	0
4/23/2019	2:46:40	772	67.4	48.7	0
4/23/2019	2:47:40	787	67.5	48.6	0
4/23/2019	2:48:40	798	67.5	48.6	0
4/23/2019	2:49:40	797	67.5	48.4	0.1
4/23/2019	2:50:40	809	67.6	48.3	0.1
4/23/2019	2:51:40	833	67.6	48.5	0.2
4/23/2019	2:52:39	841	67.6	48.7	0.1
4/23/2019	2:53:39	858	67.6	48.9	0.3
4/23/2019	2:54:39	870	67.7	48.9	0.2
4/23/2019	2:55:39	849	67.7	48.5	0.3
4/23/2019	2:56:39	874	67.7	48.8	0.3
4/23/2019	2:57:39	885	67.7	48.6	0.6
4/23/2019	2:58:39	900	67.8	48.6	0.6
4/23/2019	2:59:39	919	67.8	48.5	0.7
4/23/2019	3:00:39	934	67.8	48.5	0.6

4/23/2019	3:01:39	939	67.8	48.4	0.6
4/23/2019	3:02:39	952	67.8	48.6	0.7
4/23/2019	3:03:39	967	67.9	48.8	0.6
4/23/2019	3:04:39	986	67.9	48.9	0.7
4/23/2019	3:05:39	990	67.9	49	0.8
4/23/2019	3:06:39	994	67.9	49	0.8
4/23/2019	3:07:39	1000	67.9	49.1	0.8
4/23/2019	3:08:39	1004	67.9	49.1	0.8
4/23/2019	3:09:39	1007	67.9	49.1	0.8
4/23/2019	3:10:39	979	67.9	48.7	0.6
4/23/2019	3:11:39	985	67.9	48.8	0.8
4/23/2019	3:12:39	994	67.9	48.8	0.7
4/23/2019	3:13:39	998	67.9	48.7	0.6
4/23/2019	3:14:39	1007	68	48.6	0.6
4/23/2019	3:15:39	1015	68	48.5	0.6
4/23/2019	3:16:39	1023	68	48.6	0.7
4/23/2019	3:17:39	1035	68	48.7	0.6
4/23/2019	3:18:39	1048	68	48.8	0.6
4/23/2019	3:19:39	1054	68	48.8	0.6
4/23/2019	3:20:39	1061	68.1	48.9	0.6
4/23/2019	3:21:39	1063	68.1	48.9	0.6
4/23/2019	3:22:39	1071	68.1	49	0.5
4/23/2019	3:23:39	1077	68.1	49.1	0.5
4/23/2019	3:24:39	1080	68.1	49	0.6
4/23/2019	3:25:39	1067	68.1	48.9	0.4
4/23/2019	3:26:39	1048	68.1	48.9	0.4
4/23/2019	3:27:39	1055	68.1	48.7	0.5
4/23/2019	3:28:39	1055	68.1	48.5	0.5
4/23/2019	3:29:39	1069	68.1	48.6	0.4
4/23/2019	3:30:39	1077	68.1	48.5	0.4
4/23/2019	3:31:39	1083	68.1	48.5	0.4
4/23/2019	3:32:39	1090	68.1	48.5	0.4
4/23/2019	3:33:39	1096	68.2	48.6	0.4
4/23/2019	3:34:39	1101	68.2	48.6	0.3

4/23/2019	3:35:39	1108	68.2	48.7	0.3
4/23/2019	3:36:39	1112	68.2	48.8	0.3
4/23/2019	3:37:39	1115	68.2	48.9	0.2
4/23/2019	3:38:39	1114	68.2	49	0.3
4/23/2019	3:39:39	1120	68.2	49	0.3
4/23/2019	3:40:39	1120	68.2	49.1	0.2
4/23/2019	3:41:39	1082	68.2	48.9	0.2
4/23/2019	3:42:39	1084	68.2	49	0.2
4/23/2019	3:43:39	1079	68.2	48.7	0.2
4/23/2019	3:44:39	1087	68.2	48.8	0.2
4/23/2019	3:45:39	1093	68.2	48.7	0.2
4/23/2019	3:46:39	1099	68.2	48.7	0.2
4/23/2019	3:47:39	1106	68.2	48.7	0.2
4/23/2019	3:48:39	1114	68.2	48.8	0.2
4/23/2019	3:49:39	1123	68.2	49	0.2
4/23/2019	3:50:39	1127	68.2	49.1	0.1
4/23/2019	3:51:39	1134	68.3	49.2	0.3
4/23/2019	3:52:39	1145	68.3	49.4	0.2
4/23/2019	3:53:39	1156	68.3	49.5	0.3
4/23/2019	3:54:39	1098	68.3	49.1	0.3
4/23/2019	3:55:39	930	68.2	49.6	0.1
4/23/2019	3:56:39	848	68.1	49.9	0
4/23/2019	3:57:39	816	68.1	49.9	0
4/23/2019	3:58:39	780	68	50	0
4/23/2019	3:59:39	752	67.9	50	0
4/23/2019	4:00:39	724	67.9	50	0
4/23/2019	4:01:39	723	67.8	50	0
4/23/2019	4:02:38	698	67.8	50	0
4/23/2019	4:03:38	684	67.8	49.9	0
4/23/2019	4:04:38	677	67.8	49.9	0
4/23/2019	4:05:38	656	67.8	49.9	0
4/23/2019	4:06:38	646	67.7	49.9	0
4/23/2019	4:07:38	633	67.7	50	0
4/23/2019	4:08:38	620	67.7	50	0

4/23/2019	4:09:38	607	67.7	50	0
4/23/2019	4:10:38	594	67.6	50.2	0
4/23/2019	4:11:38	591	67.6	50.5	0
4/23/2019	4:12:38	588	67.6	50.5	0
4/23/2019	4:13:38	581	67.5	50.6	0
4/23/2019	4:14:38	570	67.5	50.7	0
4/23/2019	4:15:38	563	67.5	50.6	0
4/23/2019	4:16:38	561	67.5	50.5	0
4/23/2019	4:17:38	558	67.5	50.5	0
4/23/2019	4:18:38	555	67.5	50.4	0
4/23/2019	4:19:38	551	67.5	50.4	0
4/23/2019	4:20:38	544	67.5	50.4	0
4/23/2019	4:21:38	537	67.4	50.4	0
4/23/2019	4:22:38	534	67.4	50.4	0
4/23/2019	4:23:38	529	67.4	50.4	0
4/23/2019	4:24:38	525	67.4	50.4	0
4/23/2019	4:25:38	519	67.4	50.5	0
4/23/2019	4:26:38	517	67.4	50.8	0
4/23/2019	4:27:38	516	67.3	50.8	0
4/23/2019	4:28:38	515	67.3	50.9	0
4/23/2019	4:29:38	511	67.3	50.9	0
4/23/2019	4:30:38	509	67.3	50.9	0
4/23/2019	4:31:38	510	67.3	50.7	0
4/23/2019	4:32:38	506	67.3	50.7	0
4/23/2019	4:33:38	503	67.3	50.6	0
4/23/2019	4:34:38	499	67.3	50.6	0
4/23/2019	4:35:38	495	67.3	50.6	0
4/23/2019	4:36:38	491	67.2	50.6	0
4/23/2019	4:37:38	490	67.2	50.6	0
4/23/2019	4:38:38	487	67.2	50.6	0
4/23/2019	4:39:38	483	67.2	50.7	0
4/23/2019	4:40:38	476	67.2	51	0
4/23/2019	4:41:38	488	67.1	51.5	0
4/23/2019	4:42:38	510	67.3	51.4	0



4/23/2019	4:43:38	512	67.3	51.2	0
4/23/2019	4:44:38	534	67.4	51	0
4/23/2019	4:45:38	584	67.5	51.3	0
4/23/2019	4:46:38	620	67.6	51.1	0
4/23/2019	4:47:38	638	67.7	50.9	0
4/23/2019	4:48:38	660	67.7	50.8	0
4/23/2019	4:49:38	679	67.7	50.8	0
4/23/2019	4:50:38	702	67.7	50.8	0
4/23/2019	4:51:38	722	67.7	50.9	0
4/23/2019	4:52:38	734	67.8	51	0
4/23/2019	4:53:38	737	67.8	50.9	0
4/23/2019	4:54:38	742	67.8	50.9	0
4/23/2019	4:55:38	763	67.8	51.1	0
4/23/2019	4:56:38	742	67.8	50.8	0
4/23/2019	4:57:38	737	67.8	50.8	0
4/23/2019	4:58:38	752	67.8	50.7	0
4/23/2019	4:59:38	757	67.8	50.6	0
4/23/2019	5:00:38	771	67.8	50.6	0
4/23/2019	5:01:38	794	67.8	50.7	0.1
4/23/2019	5:02:38	803	67.8	50.6	0.1
4/23/2019	5:03:38	820	67.8	50.7	0.1
4/23/2019	5:04:38	833	67.9	51.1	0.1
4/23/2019	5:05:38	834	67.9	51	0.1
4/23/2019	5:06:38	742	67.8	50.9	0
4/23/2019	5:07:38	656	67.8	51.3	0
4/23/2019	5:08:38	628	67.7	51.3	0
4/23/2019	5:09:38	630	67.7	51.2	0
4/23/2019	5:10:38	627	67.6	51.3	0
4/23/2019	5:11:38	615	67.6	51.3	0
4/23/2019	5:12:37	597	67.5	51.5	0
4/23/2019	5:13:37	591	67.4	51.5	0
4/23/2019	5:14:37	576	67.4	51.7	0
4/23/2019	5:15:37	566	67.4	51.7	0
4/23/2019	5:16:37	556	67.3	51.6	0

4/23/2019	5:17:37	548	67.3	51.6	0
4/23/2019	5:18:37	542	67.3	51.6	0
4/23/2019	5:19:37	538	67.3	51.5	0
4/23/2019	5:20:37	531	67.3	51.5	0
4/23/2019	5:21:37	527	67.3	51.5	0
4/23/2019	5:22:37	525	67.3	51.5	0
4/23/2019	5:23:37	521	67.2	51.5	0
4/23/2019	5:24:37	516	67.2	51.6	0
4/23/2019	5:25:37	511	67.2	51.6	0
4/23/2019	5:26:37	506	67.2	51.7	0
4/23/2019	5:27:37	500	67.1	51.9	0
4/23/2019	5:28:37	504	67.1	52	0
4/23/2019	5:29:37	504	67.1	51.8	0
4/23/2019	5:30:37	503	67	51.9	0
4/23/2019	5:31:37	497	67	51.9	0
4/23/2019	5:32:37	495	67	51.8	0
4/23/2019	5:33:37	495	67	51.7	0
4/23/2019	5:34:37	492	67	51.7	0
4/23/2019	5:35:37	489	67	51.6	0
4/23/2019	5:36:37	486	67	51.6	0
4/23/2019	5:37:37	482	67	51.7	0
4/23/2019	5:38:37	477	67	51.8	0
4/23/2019	5:39:37	477	67	51.8	0
4/23/2019	5:40:37	479	67	51.7	0
4/23/2019	5:41:37	478	67	51.8	0
4/23/2019	5:42:37	488	67	52.2	0
4/23/2019	5:43:37	518	67.1	52.1	0
4/23/2019	5:44:37	540	67.1	52	0
4/23/2019	5:45:37	558	67.2	51.8	0
4/23/2019	5:46:37	582	67.2	51.8	0
4/23/2019	5:47:37	606	67.3	51.7	0
4/23/2019	5:48:37	619	67.3	51.6	0
4/23/2019	5:49:37	623	67.3	51.6	0
4/23/2019	5:50:37	636	67.3	51.6	0

4/23/2019	5:51:37	652	67.3	51.6	0
4/23/2019	5:52:37	660	67.3	51.5	0
4/23/2019	5:53:37	662	67.4	51.6	0
4/23/2019	5:54:37	677	67.4	51.7	0
4/23/2019	5:55:37	679	67.4	51.6	0
4/23/2019	5:56:37	682	67.4	51.6	0
4/23/2019	5:57:37	685	67.4	51.6	0
4/23/2019	5:58:37	691	67.4	51.6	0
4/23/2019	5:59:37	678	67.4	51.6	0
4/23/2019	6:00:37	685	67.4	51.5	0
4/23/2019	6:01:37	703	67.4	51.7	0
4/23/2019	6:02:37	714	67.4	51.6	0
4/23/2019	6:03:37	729	67.4	51.5	0
4/23/2019	6:04:37	734	67.4	51.5	0
4/23/2019	6:05:37	738	67.4	51.5	0
4/23/2019	6:06:37	754	67.4	51.6	0
4/23/2019	6:07:37	763	67.4	51.7	0
4/23/2019	6:08:37	764	67.4	51.6	0
4/23/2019	6:09:37	772	67.4	51.6	0
4/23/2019	6:10:37	780	67.4	51.7	0
4/23/2019	6:11:37	798	67.4	51.8	0
4/23/2019	6:12:37	799	67.4	51.7	0
4/23/2019	6:13:37	797	67.4	51.7	0
4/23/2019	6:14:37	817	67.4	51.8	0
4/23/2019	6:15:37	800	67.4	51.8	0
4/23/2019	6:16:37	770	67.4	51.7	0
4/23/2019	6:17:37	783	67.4	51.6	0
4/23/2019	6:18:37	793	67.4	51.4	0
4/23/2019	6:19:37	814	67.4	51.6	0
4/23/2019	6:20:37	832	67.4	51.7	0
4/23/2019	6:21:36	852	67.5	52.1	0
4/23/2019	6:22:36	864	67.6	52.5	0
4/23/2019	6:23:36	862	67.6	52.4	0.1
4/23/2019	6:24:36	854	67.6	52.2	0.1

4/23/2019	6:25:36	848	67.6	52.1	0.1
4/23/2019	6:26:36	843	67.6	52	0.1
4/23/2019	6:27:36	838	67.6	52	0.1
4/23/2019	6:28:36	826	67.5	52	0
4/23/2019	6:29:36	812	67.5	51.9	0.1
4/23/2019	6:30:36	797	67.5	51.8	0
4/23/2019	6:31:36	784	67.4	51.7	0
4/23/2019	6:32:36	749	67.4	51.7	0
4/23/2019	6:33:36	695	67.4	51.7	0
4/23/2019	6:34:36	693	67.3	51.6	0
4/23/2019	6:35:36	691	67.3	51.5	0
4/23/2019	6:36:36	697	67.3	51.6	0
4/23/2019	6:37:36	699	67.3	51.6	0
4/23/2019	6:38:36	695	67.3	51.5	0
4/23/2019	6:39:36	672	67.3	52.1	0
4/23/2019	6:40:36	656	67.3	52.7	0
4/23/2019	6:41:36	631	67.3	53.1	0
4/23/2019	6:42:36	651	67.3	53.3	0
4/23/2019	6:43:36	631	67.3	53.6	0
4/23/2019	6:44:36	664	67.4	54.1	0
4/23/2019	10:36:01	484	67.4	59.9	0.9
4/23/2019	10:37:01	461	67.5	58.7	0.8
4/23/2019	10:38:01	483	67.5	58.3	0.8
4/23/2019	10:39:01	464	67.6	58	0.7
4/23/2019	10:40:01	486	67.6	57.9	0.7
4/23/2019	10:41:01	531	67.6	57.9	0.7
4/23/2019	10:42:01	543	67.7	57.8	0.6
4/23/2019	10:43:01	501	67.8	57.4	0.6
4/23/2019	10:44:01	473	67.8	57.2	0.4
4/23/2019	10:45:01	455	67.8	56.9	0.3
4/23/2019	10:46:01	441	67.9	56.7	0.3
4/23/2019	10:47:01	464	67.9	56.7	0.3
4/23/2019	10:48:01	480	68	56.6	0.3
4/23/2019	10:49:01	486	68	56.5	0.4

4/23/2019	10:50:01	498	68.1	56.4	0.4
4/23/2019	10:51:01	504	68.1	56.3	0.3
4/23/2019	10:52:01	509	68.2	56.1	0.4
4/23/2019	10:53:01	511	68.2	56	0.3
4/23/2019	10:54:01	514	68.3	55.8	0.2
4/23/2019	10:55:01	505	68.3	55.7	0.2
4/23/2019	10:56:01	489	68.3	55.5	0.3
4/23/2019	10:57:01	481	68.4	55.4	0.2
4/23/2019	10:58:01	492	68.4	55.4	0.2
4/23/2019	10:59:01	533	68.5	55.6	0.2
4/23/2019	11:00:01	611	68.6	55.9	0.2
4/23/2019	11:01:01	585	68.6	55.3	0.2
4/23/2019	11:02:01	537	68.6	54.7	0.2
4/23/2019	11:03:01	541	68.6	54.8	0.2
4/23/2019	11:04:01	528	68.6	54.5	0.2
4/23/2019	11:05:01	517	68.5	54.4	0.3
4/23/2019	11:06:01	499	68.5	54.4	0.2
4/23/2019	11:07:01	500	68.5	54.5	0.1
4/23/2019	11:08:01	503	68.5	54.5	0.2
4/23/2019	11:09:01	501	68.5	54.5	0.1
4/23/2019	11:10:01	494	68.5	54.4	0.2
4/23/2019	11:11:01	478	68.5	54.3	0.1
4/23/2019	11:12:01	471	68.4	54.2	0.2
4/23/2019	11:13:01	451	68.4	54.3	0.1
4/23/2019	11:14:01	437	68.4	54.4	0.1
4/23/2019	11:15:01	438	68.4	54.3	0.1
4/23/2019	11:16:01	438	68.4	54.2	0.1
4/23/2019	11:17:01	432	68.4	54.4	0.1
4/23/2019	11:18:01	433	68.4	54.3	0
4/23/2019	11:19:01	434	68.4	54.2	0.1
4/23/2019	11:20:01	423	68.4	54.2	0.1
4/23/2019	11:21:01	419	68.5	54.2	0.1
4/23/2019	11:22:01	415	68.5	54.1	0.1
4/23/2019	11:23:01	413	68.5	54.1	0



4/23/2019	11:24:01	413	68.5	54.1	0.1
4/23/2019	11:25:01	414	68.5	54	0.1
4/23/2019	11:26:01	414	68.5	54	0
4/23/2019	11:27:01	418	68.6	54.1	0.1
4/23/2019	11:28:01	417	68.6	54.1	0
4/23/2019	11:29:00	417	68.6	54.1	0.1
4/23/2019	11:30:00	417	68.7	53.9	0.1
4/23/2019	11:31:00	413	68.7	53.9	0.1
4/23/2019	11:32:00	412	68.7	53.7	0
4/23/2019	11:33:00	412	68.8	53.8	0
4/23/2019	11:34:00	413	68.8	53.8	0.1
4/23/2019	11:35:00	414	68.8	53.8	0.1
4/23/2019	11:36:00	415	68.8	53.7	0.1
4/23/2019	11:37:00	416	68.8	53.7	0
4/23/2019	11:38:00	418	68.9	53.7	0
4/23/2019	11:39:00	416	68.9	53.6	0.1
4/23/2019	11:40:00	410	68.9	53.4	0
4/23/2019	11:41:00	408	68.9	53.3	0
4/23/2019	11:42:00	411	68.9	53.3	0.1
4/23/2019	11:43:00	413	69	53.4	0.1
4/23/2019	11:44:00	412	69	53.4	0.1
4/23/2019	11:45:00	411	69	53.3	0.1
4/23/2019	11:46:00	409	69	53.3	0.1
4/23/2019	11:47:00	410	69	53.2	0.1
4/23/2019	11:48:00	409	69	53.2	0
4/23/2019	11:49:00	408	69.1	53.2	0.1
4/23/2019	11:50:00	407	69.1	53.2	0.1
4/23/2019	11:51:00	407	69.1	53.1	0
4/23/2019	11:52:00	407	69.2	53.1	0
4/23/2019	11:53:00	404	69.2	53	0.1
4/23/2019	11:54:00	403	69.2	53	0.1
4/23/2019	11:55:00	403	69.2	53	0
4/23/2019	11:56:00	403	69.2	53	0
4/23/2019	11:57:00	403	69.2	53	0

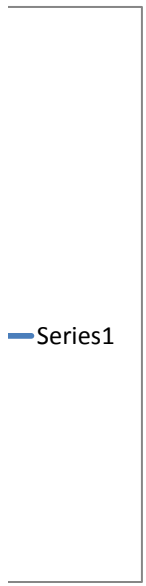
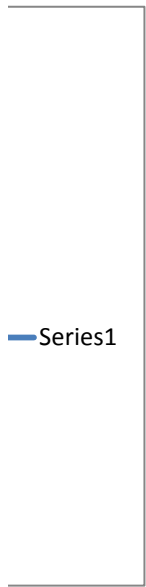
4/23/2019	11:58:00	403	69.3	52.9	0
4/23/2019	11:59:00	402	69.3	52.9	0
4/23/2019	12:00:00	401	69.3	52.9	0
4/23/2019	12:01:00	405	69.4	52.9	0
4/23/2019	12:02:00	409	69.4	53	0.1
4/23/2019	12:03:00	410	69.4	53.4	0.1
4/23/2019	12:04:00	407	69.4	53.2	0.1
4/23/2019	12:05:00	401	69.5	53.3	0
4/23/2019	12:06:00	399	69.5	53.3	0
4/23/2019	12:07:00	397	69.5	53.3	0
4/23/2019	12:08:00	396	69.5	53.2	0
4/23/2019	12:09:00	398	69.5	53.1	0
4/23/2019	12:10:00	398	69.5	53.1	0
4/23/2019	12:11:00	396	69.6	53.3	0
4/23/2019	12:12:00	395	69.6	53.2	0
4/23/2019	12:13:00	398	69.6	53	0.1
4/23/2019	12:14:00	398	69.6	52.9	0
4/23/2019	12:15:00	398	69.7	52.9	0
4/23/2019	12:16:00	398	69.7	52.8	0
4/23/2019	12:17:00	399	69.7	52.8	0
4/23/2019	12:18:00	399	69.7	52.8	0
4/23/2019	12:19:00	400	69.8	52.7	0
4/23/2019	12:20:00	401	69.8	52.6	0
4/23/2019	12:21:00	404	69.8	52.4	0.1
4/23/2019	12:22:00	404	69.8	52.3	0.1
4/23/2019	12:23:00	405	69.8	52.2	0
4/23/2019	12:24:00	406	69.8	52	0
4/23/2019	12:25:00	405	69.9	52	0
4/23/2019	12:26:00	403	69.8	52	0
4/23/2019	12:27:00	405	69.8	51.9	0
4/23/2019	12:28:00	407	69.9	51.7	0
4/23/2019	12:29:00	407	69.9	51.7	0
4/23/2019	12:30:00	406	69.9	51.7	0
4/23/2019	12:31:00	408	70	51.6	0

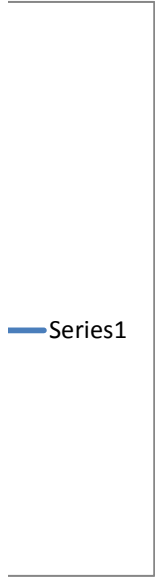
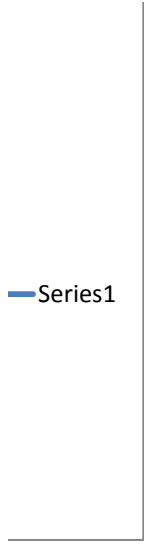
4/23/2019	12:32:00	408	70	51.7	0
4/23/2019	12:33:00	410	70	51.7	0
4/23/2019	12:34:00	411	70	51.7	0
4/23/2019	12:35:00	407	70	51.7	0
4/23/2019	12:36:00	407	70	51.5	0.1
4/23/2019	12:37:00	409	70.1	51.3	0
4/23/2019	12:37:59	407	70.1	51.3	0
4/23/2019	12:38:59	409	70.1	51.1	0
4/23/2019	12:39:59	409	70.2	51.1	0
4/23/2019	12:40:59	407	70.2	51.2	0
4/23/2019	12:41:59	407	70.2	51.2	0
4/23/2019	12:42:59	407	70.2	51.2	0
4/23/2019	12:43:59	407	70.2	51.3	0
4/23/2019	12:44:59	405	70.2	51.3	0.1
4/23/2019	12:45:59	404	70.2	51.3	0
4/23/2019	12:46:59	401	70.2	51.4	0
4/23/2019	12:47:59	403	70.3	51.3	0
4/23/2019	12:48:59	406	70.3	51.2	0
4/23/2019	12:49:59	408	70.4	50.8	0.1
4/23/2019	12:50:59	412	70.4	50.4	0.1
4/23/2019	12:51:59	415	70.5	50.3	0.1
4/23/2019	12:52:59	413	70.6	50.3	0.1
4/23/2019	12:53:59	433	70.4	49.6	0.1
4/23/2019	12:54:59	455	70.1	48.9	0.2
4/23/2019	12:55:59	472	69.7	48.5	0.3
4/23/2019	12:56:59	484	69.6	48.4	0.2
4/23/2019	12:57:59	489	69.4	48.3	0.1
4/23/2019	12:58:59	491	69.5	48.3	0.2
4/23/2019	12:59:59	486	69.6	48.9	0.1
4/23/2019	13:00:59	483	69.8	49.3	0.1
4/23/2019	13:01:59	477	70	49.6	0.1
4/23/2019	13:02:59	470	70.2	50	0.1
4/23/2019	13:03:59	465	70.4	50	0.1
4/23/2019	13:04:59	466	70.5	49.8	0.1

4/23/2019	13:05:59	466	70.6	49.6	0.1
4/23/2019	13:06:59	466	70.7	49.5	0.1
4/23/2019	13:07:59	464	70.8	49.6	0.2
4/23/2019	13:08:59	500	70.8	49.6	0.1
4/23/2019	13:09:59	499	70.5	48.5	0.2
4/23/2019	13:10:59	504	70.2	48	0.3
4/23/2019	13:11:59	510	69.9	47.9	0.3
4/23/2019	13:12:59	514	69.6	47.7	0.2
4/23/2019	13:13:59	539	69.2	47.1	0.3
4/23/2019	13:14:59	577	68.6	45.8	0.4
4/23/2019	13:15:59	581	68.3	45.2	0.4
4/23/2019	13:16:59	582	68.7	45.8	0.3
4/23/2019	13:17:59	578	68.8	46.4	0.2
4/23/2019	13:18:59	576	69	46.7	0.2
4/23/2019	13:19:59	586	69.2	47.2	0.2
4/23/2019	13:20:59	646	69.4	47.6	0.3
4/23/2019	13:21:59	674	69.7	48.2	0.3
4/23/2019	13:22:59	856	70.2	48.9	0.2
4/23/2019	13:23:59	677	70.3	48	0.3
4/23/2019	13:24:59	636	70.3	47.9	0.2
4/23/2019	13:25:59	605	70.4	48	0.3
4/23/2019	13:26:59	568	70.4	48.2	0.2
4/23/2019	13:27:59	554	70.4	48.3	0.2
4/23/2019	13:28:59	549	70.4	48.4	0.2
4/23/2019	13:29:59	549	70.4	48.5	0.2
4/23/2019	13:30:59	537	70.4	48.6	0.2
4/23/2019	13:31:59	531	70.4	48.7	0.2
4/23/2019	13:32:59	525	70.4	48.8	0.2
4/23/2019	13:33:59	518	70.4	48.9	0.2
4/23/2019	13:34:59	521	70.5	49.1	0.3
4/23/2019	13:35:59	519	70.5	49.1	0.2
4/23/2019	13:36:59	512	70.5	49.2	0.1
4/23/2019	13:37:59	506	70.5	49.3	0.2
4/23/2019	13:38:59	518	70.3	48.5	0.2

4/23/2019	13:39:59	552	69.7	46.1	0.4
4/23/2019	13:40:59	576	69.1	44.6	0.5
4/23/2019	13:41:59	595	68.5	43.8	0.5
4/23/2019	13:42:58	608	68.1	43.5	0.5

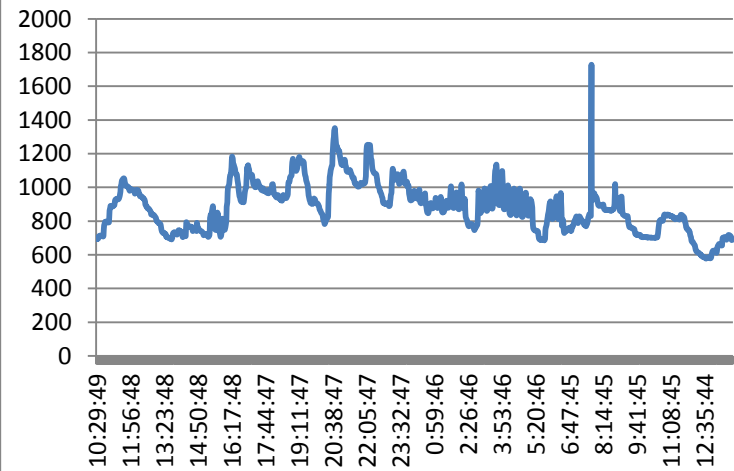




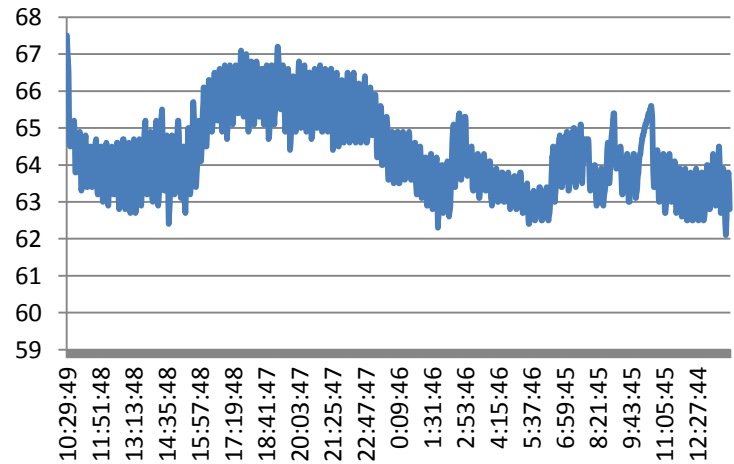


Date	Time	CO2	T	H	CO
Minutes		1640	1640	1640	1640
Minimum		577	62.1	46	0
Maximum		1727	67.5	77.5	0.9
Average		880.0037	64.6369	51.74536	0.035685
4/22/2019	10:29:49	692	67.5	56	0
4/22/2019	10:30:49	703	67.2	57.1	0
4/22/2019	10:31:49	692	67	57.2	0
4/22/2019	10:32:49	698	66.9	57.7	0
4/22/2019	10:33:49	695	66.5	57.4	0
4/22/2019	10:34:49	699	65.7	55.1	0
4/22/2019	10:35:49	705	64.8	53.9	0
4/22/2019	10:36:49	712	64.6	55.5	0
4/22/2019	10:37:49	714	64.5	56.3	0
4/22/2019	10:38:49	714	64.5	56.6	0
4/22/2019	10:39:49	714	64.6	56.7	0
4/22/2019	10:40:49	714	64.6	56.8	0
4/22/2019	10:41:49	712	64.7	56.8	0
4/22/2019	10:42:49	712	64.8	56.8	0
4/22/2019	10:43:49	711	64.9	56.7	0
4/22/2019	10:44:49	710	65	56.7	0
4/22/2019	10:45:49	710	65	56.7	0
4/22/2019	10:46:49	708	65.1	56.7	0
4/22/2019	10:47:49	712	65.2	56.7	0
4/22/2019	10:48:49	751	64.9	56.6	0
4/22/2019	10:49:49	774	64.4	55.7	0
4/22/2019	10:50:49	787	63.8	55.2	0
4/22/2019	10:51:49	795	63.8	55.6	0
4/22/2019	10:52:49	796	63.8	55.9	0
4/22/2019	10:53:49	798	63.9	56	0
4/22/2019	10:54:49	794	64	56	0
4/22/2019	10:55:49	794	64.2	55.9	0
4/22/2019	10:56:49	793	64.3	55.8	0
4/22/2019	10:57:49	793	64.5	55.7	0

## Carbon Dioxide (CO2)

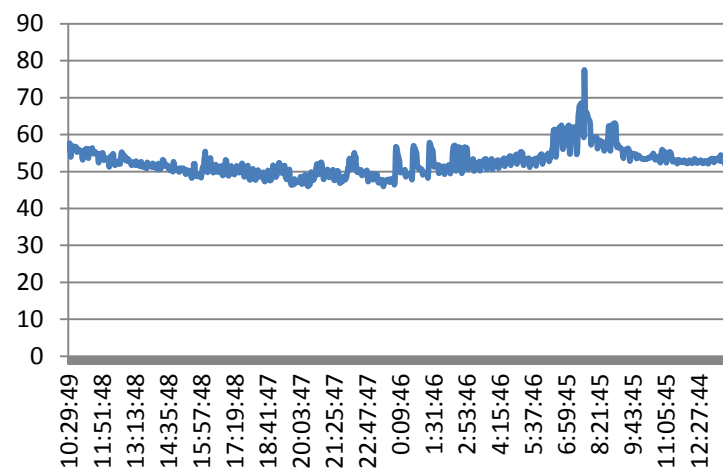


## Temperature (F)

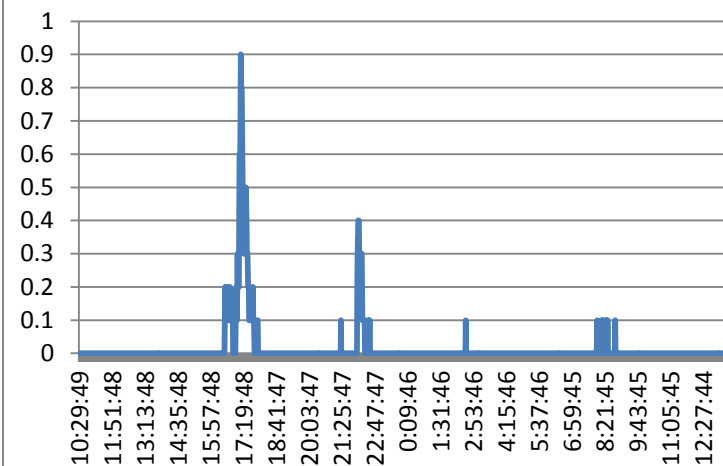


4/22/2019	10:58:49	792	64.6	55.6	0
4/22/2019	10:59:49	791	64.7	55.6	0
4/22/2019	11:00:49	792	64.8	55.5	0
4/22/2019	11:01:49	792	64.9	55.4	0
4/22/2019	11:02:49	821	64.7	55.2	0
4/22/2019	11:03:49	861	64.1	53.6	0
4/22/2019	11:04:49	879	63.5	53.2	0
4/22/2019	11:05:49	890	63.3	55.1	0
4/22/2019	11:06:49	889	63.4	55.6	0
4/22/2019	11:07:49	889	63.5	55.7	0
4/22/2019	11:08:49	887	63.7	55.8	0
4/22/2019	11:09:49	887	63.9	55.7	0
4/22/2019	11:10:49	887	64	55.6	0
4/22/2019	11:11:49	886	64.2	55.5	0
4/22/2019	11:12:49	886	64.3	55.7	0
4/22/2019	11:13:49	894	64.5	56.2	0
4/22/2019	11:14:49	896	64.6	56.2	0
4/22/2019	11:15:49	895	64.8	56.1	0
4/22/2019	11:16:49	906	64.6	56.1	0
4/22/2019	11:17:49	920	64	54.4	0
4/22/2019	11:18:49	927	63.4	53.6	0
4/22/2019	11:19:49	930	63.4	55.2	0
4/22/2019	11:20:49	930	63.4	55.7	0
4/22/2019	11:21:49	929	63.5	56	0
4/22/2019	11:22:49	930	63.7	56	0
4/22/2019	11:23:49	930	63.9	55.9	0
4/22/2019	11:24:49	930	64.1	55.9	0
4/22/2019	11:25:49	929	64.2	55.8	0
4/22/2019	11:26:49	931	64.4	55.9	0
4/22/2019	11:27:49	933	64.5	55.8	0
4/22/2019	11:28:49	944	64.5	56.4	0
4/22/2019	11:29:49	952	64.2	55.6	0
4/22/2019	11:30:49	962	63.7	54.9	0
4/22/2019	11:31:49	973	63.4	54.8	0

### Humidity (%)



### Carbon Monoxide (CO)



4/22/2019	11:32:49	1004	63.4	54.9	0
4/22/2019	11:33:49	1019	63.5	55.1	0
4/22/2019	11:34:49	1035	63.6	55.3	0
4/22/2019	11:35:49	1043	63.8	55.3	0
4/22/2019	11:36:48	1044	64	55.2	0
4/22/2019	11:37:48	1050	64.2	55.1	0
4/22/2019	11:38:48	1052	64.3	54.9	0
4/22/2019	11:39:48	1053	64.5	54.8	0
4/22/2019	11:40:48	1053	64.6	54.7	0
4/22/2019	11:41:48	1050	64.7	54.7	0
4/22/2019	11:42:48	1027	64.5	54.1	0
4/22/2019	11:43:48	1018	64	52.7	0
4/22/2019	11:44:48	1015	63.4	52.4	0
4/22/2019	11:45:48	1009	63.2	54	0
4/22/2019	11:46:48	1008	63.3	54.6	0
4/22/2019	11:47:48	1006	63.4	54.8	0
4/22/2019	11:48:48	1005	63.6	54.8	0
4/22/2019	11:49:48	1006	63.8	54.8	0
4/22/2019	11:50:48	1004	64	54.6	0
4/22/2019	11:51:48	1003	64.2	54.4	0
4/22/2019	11:52:48	1001	64.4	54.7	0
4/22/2019	11:53:48	990	64.5	55.1	0
4/22/2019	11:54:48	983	64.5	55	0
4/22/2019	11:55:48	979	64.3	53.5	0
4/22/2019	11:56:48	986	63.8	53.1	0
4/22/2019	11:57:48	990	63.2	53.1	0
4/22/2019	11:58:48	990	63	53.3	0
4/22/2019	11:59:48	988	63.1	53.6	0
4/22/2019	12:00:48	988	63.3	53.7	0
4/22/2019	12:01:48	986	63.5	53.7	0
4/22/2019	12:02:48	986	63.7	53.5	0
4/22/2019	12:03:48	982	63.9	53.4	0
4/22/2019	12:04:48	982	64.1	53.3	0
4/22/2019	12:05:48	982	64.3	53.2	0

4/22/2019	12:06:48	977	64.4	53.2	0
4/22/2019	12:07:48	974	64.6	53.3	0
4/22/2019	12:08:48	963	64.4	53.4	0
4/22/2019	12:09:48	973	63.9	52.1	0
4/22/2019	12:10:48	982	63.2	51.3	0
4/22/2019	12:11:48	984	62.9	52.7	0
4/22/2019	12:12:48	985	63.1	53.8	0
4/22/2019	12:13:48	982	63.2	54.1	0
4/22/2019	12:14:48	982	63.4	54	0
4/22/2019	12:15:48	982	63.6	53.9	0
4/22/2019	12:16:48	983	63.9	53.8	0
4/22/2019	12:17:48	980	64.1	53.6	0
4/22/2019	12:18:48	972	64.2	54.3	0
4/22/2019	12:19:48	961	64.4	54.8	0
4/22/2019	12:20:48	958	64.5	54.7	0
4/22/2019	12:21:48	948	64.4	53.3	0
4/22/2019	12:22:48	947	64.1	52.2	0
4/22/2019	12:23:48	949	63.7	51.9	0
4/22/2019	12:24:48	945	63.3	51.7	0
4/22/2019	12:25:48	943	63.2	51.9	0
4/22/2019	12:26:48	942	63.3	52.2	0
4/22/2019	12:27:48	940	63.5	52.4	0
4/22/2019	12:28:48	941	63.6	52.4	0
4/22/2019	12:29:48	936	63.8	52.4	0
4/22/2019	12:30:48	933	64	52.3	0
4/22/2019	12:31:48	932	64.2	52.2	0
4/22/2019	12:32:48	930	64.4	52.2	0
4/22/2019	12:33:48	928	64.6	52.1	0
4/22/2019	12:34:48	915	64.6	52.7	0
4/22/2019	12:35:48	896	64.3	53	0
4/22/2019	12:36:48	895	63.7	52.7	0
4/22/2019	12:37:48	890	63.1	52	0
4/22/2019	12:38:48	886	62.8	53.2	0
4/22/2019	12:39:48	884	63	54.2	0



4/22/2019	12:40:48	878	63.1	55.1	0
4/22/2019	12:41:48	875	63.3	55.2	0
4/22/2019	12:42:48	876	63.5	55	0
4/22/2019	12:43:48	874	63.8	54.9	0
4/22/2019	12:44:48	874	64	54.6	0
4/22/2019	12:45:48	868	64.2	54.4	0
4/22/2019	12:46:48	866	64.3	54.2	0
4/22/2019	12:47:48	864	64.5	54	0
4/22/2019	12:48:48	859	64.7	53.8	0
4/22/2019	12:49:48	851	64.7	54	0
4/22/2019	12:50:48	840	64.4	53.9	0
4/22/2019	12:51:48	839	63.9	53.2	0
4/22/2019	12:52:48	840	63.3	52.9	0
4/22/2019	12:53:48	841	62.8	52.9	0
4/22/2019	12:54:48	837	63	53.3	0
4/22/2019	12:55:48	836	63.2	53.4	0
4/22/2019	12:56:48	835	63.4	53.4	0
4/22/2019	12:57:48	835	63.6	53.3	0
4/22/2019	12:58:48	832	63.8	53.1	0
4/22/2019	12:59:48	829	64.1	52.8	0
4/22/2019	13:00:48	826	64.3	52.7	0
4/22/2019	13:01:48	824	64.5	52.6	0
4/22/2019	13:02:48	818	64.6	52.7	0
4/22/2019	13:03:48	806	64.4	52.5	0
4/22/2019	13:04:48	802	63.9	51.9	0
4/22/2019	13:05:48	802	63.3	51.7	0
4/22/2019	13:06:48	797	62.7	51.8	0
4/22/2019	13:07:48	794	62.8	52.3	0
4/22/2019	13:08:48	790	63.1	52.5	0
4/22/2019	13:09:48	790	63.3	52.5	0
4/22/2019	13:10:48	788	63.6	52.4	0
4/22/2019	13:11:48	785	63.9	52.2	0
4/22/2019	13:12:48	786	64.2	52.1	0
4/22/2019	13:13:48	784	64.4	51.9	0

4/22/2019	13:14:48	783	64.6	51.8	0
4/22/2019	13:15:48	774	64.7	52.3	0
4/22/2019	13:16:48	749	64.4	52.8	0
4/22/2019	13:17:48	742	63.8	52	0
4/22/2019	13:18:48	737	63.2	51.8	0
4/22/2019	13:19:48	734	62.7	51.7	0
4/22/2019	13:20:48	730	62.8	51.9	0
4/22/2019	13:21:48	728	63	52.1	0
4/22/2019	13:22:48	729	63.3	52	0
4/22/2019	13:23:48	727	63.5	51.9	0
4/22/2019	13:24:48	728	63.8	51.8	0
4/22/2019	13:25:48	725	64.1	51.6	0
4/22/2019	13:26:48	726	64.3	51.4	0
4/22/2019	13:27:48	724	64.5	51.4	0
4/22/2019	13:28:48	719	64.7	51.6	0
4/22/2019	13:29:48	706	64.6	52.6	0
4/22/2019	13:30:48	706	64.1	51.9	0
4/22/2019	13:31:48	706	63.6	51.5	0
4/22/2019	13:32:48	702	63	51.3	0
4/22/2019	13:33:48	703	62.9	51.4	0
4/22/2019	13:34:48	702	63.1	51.7	0
4/22/2019	13:35:48	700	63.3	51.8	0
4/22/2019	13:36:48	698	63.6	51.8	0
4/22/2019	13:37:48	698	63.9	51.6	0
4/22/2019	13:38:48	696	64.2	51.4	0
4/22/2019	13:39:48	695	64.4	51.3	0
4/22/2019	13:40:48	696	64.7	51.1	0
4/22/2019	13:41:48	696	64.9	50.9	0
4/22/2019	13:42:48	694	65.1	50.8	0
4/22/2019	13:43:48	691	65.2	51.5	0
4/22/2019	13:44:48	700	64.8	52.5	0
4/22/2019	13:45:48	716	64.2	51.8	0
4/22/2019	13:46:48	726	63.6	51.5	0
4/22/2019	13:47:48	729	63.2	51.4	0

4/22/2019	13:48:48	731	63.2	51.6	0
4/22/2019	13:49:48	732	63.4	51.9	0
4/22/2019	13:50:48	732	63.6	51.9	0
4/22/2019	13:51:48	731	63.9	51.7	0
4/22/2019	13:52:48	730	64.1	51.6	0
4/22/2019	13:53:48	727	64.3	51.5	0
4/22/2019	13:54:48	728	64.6	51.4	0
4/22/2019	13:55:48	724	64.8	51.3	0
4/22/2019	13:56:48	722	64.9	51.4	0
4/22/2019	13:57:48	719	64.8	52.2	0
4/22/2019	13:58:48	730	64.2	51.5	0
4/22/2019	13:59:48	737	63.6	51.2	0
4/22/2019	14:00:48	745	63.1	51.2	0
4/22/2019	14:01:48	746	63	51.3	0
4/22/2019	14:02:48	745	63.1	51.6	0
4/22/2019	14:03:48	744	63.4	51.7	0
4/22/2019	14:04:48	742	63.7	51.6	0
4/22/2019	14:05:48	738	64	51.5	0
4/22/2019	14:06:48	736	64.3	51.3	0
4/22/2019	14:07:48	738	64.5	51	0
4/22/2019	14:08:48	737	64.8	50.7	0
4/22/2019	14:09:48	736	65	50.6	0
4/22/2019	14:10:48	732	65.2	50.8	0
4/22/2019	14:11:48	707	65.1	52.1	0
4/22/2019	14:12:48	704	64.5	51.3	0
4/22/2019	14:13:48	709	63.8	50.9	0
4/22/2019	14:14:48	712	63.2	50.6	0
4/22/2019	14:15:48	712	62.9	50.6	0
4/22/2019	14:16:48	713	63.1	51	0
4/22/2019	14:17:48	711	63.3	51.1	0
4/22/2019	14:18:48	711	63.6	51.1	0
4/22/2019	14:19:48	710	63.9	51	0
4/22/2019	14:20:48	760	64.4	51.4	0
4/22/2019	14:21:48	793	64.8	52.8	0

4/22/2019	14:22:48	785	65.1	53.2	0
4/22/2019	14:23:48	779	65.3	53	0
4/22/2019	14:24:48	765	65.5	53	0
4/22/2019	14:25:48	767	65.2	52.6	0
4/22/2019	14:26:48	768	64.6	51.9	0
4/22/2019	14:27:48	766	64.2	51.7	0
4/22/2019	14:28:48	766	63.7	51.6	0
4/22/2019	14:29:48	768	63.4	51.5	0
4/22/2019	14:30:48	768	63.3	51.7	0
4/22/2019	14:31:48	765	63.5	51.9	0
4/22/2019	14:32:48	764	63.8	51.8	0
4/22/2019	14:33:48	767	64.1	51.6	0
4/22/2019	14:34:48	764	64.4	51.3	0
4/22/2019	14:35:48	765	64.6	51.1	0
4/22/2019	14:36:48	753	64.8	51.4	0
4/22/2019	14:37:48	740	64.5	51.3	0
4/22/2019	14:38:48	744	63.9	50.6	0
4/22/2019	14:39:48	747	63.4	50.5	0
4/22/2019	14:40:48	748	62.8	50.3	0
4/22/2019	14:41:48	747	62.4	50.3	0
4/22/2019	14:42:48	747	62.6	50.6	0
4/22/2019	14:43:48	747	62.9	50.7	0
4/22/2019	14:44:48	746	63.2	50.7	0
4/22/2019	14:45:48	744	63.5	50.6	0
4/22/2019	14:46:48	742	63.8	50.3	0
4/22/2019	14:47:48	740	64.1	50	0
4/22/2019	14:48:48	789	64.5	51.5	0
4/22/2019	14:49:48	778	64.8	52.6	0
4/22/2019	14:50:48	758	64.7	51.9	0
4/22/2019	14:51:48	753	64.4	51.3	0
4/22/2019	14:52:48	753	64.2	51.3	0
4/22/2019	14:53:48	753	63.9	51.1	0
4/22/2019	14:54:48	748	63.3	50.5	0
4/22/2019	14:55:48	744	63.2	50.5	0

4/22/2019	14:56:48	743	63.4	50.7	0
4/22/2019	14:57:48	743	63.6	50.7	0
4/22/2019	14:58:48	742	63.8	50.7	0
4/22/2019	14:59:48	740	64.1	50.5	0
4/22/2019	15:00:48	738	64.4	50.4	0
4/22/2019	15:01:48	737	64.6	50.1	0
4/22/2019	15:02:48	734	64.9	50	0
4/22/2019	15:03:48	730	65.1	49.9	0
4/22/2019	15:04:48	722	65.2	50.1	0
4/22/2019	15:05:48	715	65.2	50.9	0
4/22/2019	15:06:48	717	64.8	50.5	0
4/22/2019	15:07:48	721	64.3	50.5	0
4/22/2019	15:08:48	723	63.9	50.5	0
4/22/2019	15:09:48	724	63.5	50.6	0
4/22/2019	15:10:48	723	63.2	50.6	0
4/22/2019	15:11:48	722	63.1	50.7	0
4/22/2019	15:12:48	721	63.4	50.9	0
4/22/2019	15:13:48	719	63.6	50.8	0
4/22/2019	15:14:48	718	63.9	50.7	0
4/22/2019	15:15:48	719	64.2	50.4	0
4/22/2019	15:16:48	718	64.5	50.2	0
4/22/2019	15:17:48	707	64.5	50.2	0
4/22/2019	15:18:48	706	64.1	49.4	0
4/22/2019	15:19:48	712	63.6	49.3	0
4/22/2019	15:20:48	716	63	49.5	0
4/22/2019	15:21:48	739	62.9	49.8	0
4/22/2019	15:22:48	819	62.7	50.3	0
4/22/2019	15:23:48	838	63	50.4	0
4/22/2019	15:24:48	833	63.3	50.3	0
4/22/2019	15:25:48	836	63.7	50.2	0
4/22/2019	15:26:48	846	64	50	0
4/22/2019	15:27:48	859	64.4	50	0
4/22/2019	15:28:48	881	64.7	50.1	0
4/22/2019	15:29:48	888	65	50.1	0

4/22/2019	15:30:48	855	64.9	49.6	0
4/22/2019	15:31:48	840	64.5	49.1	0
4/22/2019	15:32:48	808	64	48.6	0
4/22/2019	15:33:48	782	63.6	48.4	0
4/22/2019	15:34:48	764	63.2	48.2	0
4/22/2019	15:35:48	749	63.3	48.4	0
4/22/2019	15:36:48	747	63.5	48.7	0
4/22/2019	15:37:48	746	63.7	48.8	0
4/22/2019	15:38:48	759	64.1	49.4	0
4/22/2019	15:39:48	779	64.8	52	0
4/22/2019	15:40:48	824	65.2	51.8	0
4/22/2019	15:41:48	850	65.7	52.1	0
4/22/2019	15:42:48	839	65.7	50.5	0
4/22/2019	15:43:48	814	65.5	49.4	0
4/22/2019	15:44:48	786	65	48.9	0
4/22/2019	15:45:48	759	64.4	48.8	0
4/22/2019	15:46:48	741	64	48.8	0
4/22/2019	15:47:48	726	63.7	48.8	0
4/22/2019	15:48:48	713	63.4	48.7	0
4/22/2019	15:49:48	707	63.5	48.9	0
4/22/2019	15:50:48	710	63.7	49.2	0
4/22/2019	15:51:48	717	64	49.2	0
4/22/2019	15:52:48	744	64.3	49.1	0
4/22/2019	15:53:48	787	64.7	49.1	0
4/22/2019	15:54:48	815	65	49.1	0
4/22/2019	15:55:48	812	65.2	49.1	0
4/22/2019	15:56:48	792	64.9	48.5	0
4/22/2019	15:57:48	767	64.5	48.3	0
4/22/2019	15:58:48	753	64.1	48.8	0
4/22/2019	15:59:48	747	64.1	49.8	0
4/22/2019	16:00:48	748	64.1	50.7	0
4/22/2019	16:01:48	764	64.1	51.1	0
4/22/2019	16:02:48	774	64.3	51.3	0
4/22/2019	16:03:48	788	64.6	51.4	0



4/22/2019	16:04:48	804	65	52	0
4/22/2019	16:05:48	884	65.4	53.4	0
4/22/2019	16:06:48	911	65.7	54.2	0
4/22/2019	16:07:48	970	66.1	55.4	0
4/22/2019	16:08:48	999	66	53.1	0
4/22/2019	16:09:48	1004	65.8	50.8	0
4/22/2019	16:10:48	1011	65.5	50.3	0
4/22/2019	16:11:48	1022	64.9	50	0
4/22/2019	16:12:48	1043	64.7	49.9	0
4/22/2019	16:13:48	1062	64.5	49.8	0
4/22/2019	16:14:48	1073	64.5	50	0
4/22/2019	16:15:48	1075	64.7	50.3	0
4/22/2019	16:16:48	1096	65	51	0
4/22/2019	16:17:48	1119	65.4	51.3	0
4/22/2019	16:18:48	1164	65.7	52.2	0
4/22/2019	16:19:48	1182	66	53.3	0
4/22/2019	16:20:48	1171	66.3	53.7	0
4/22/2019	16:21:48	1146	66.3	52.3	0
4/22/2019	16:22:48	1138	66.1	51.6	0
4/22/2019	16:23:48	1135	65.7	51.2	0
4/22/2019	16:24:48	1127	65.6	51.2	0
4/22/2019	16:25:48	1117	65.4	50.7	0
4/22/2019	16:26:48	1109	65.1	50	0
4/22/2019	16:27:48	1094	64.9	49.7	0
4/22/2019	16:28:48	1086	64.9	49.7	0
4/22/2019	16:29:48	1079	65.1	49.9	0
4/22/2019	16:30:48	1079	65.4	50.4	0
4/22/2019	16:31:48	1074	65.7	50.7	0
4/22/2019	16:32:48	1055	66	51.1	0
4/22/2019	16:33:48	1041	66.3	51.9	0.1
4/22/2019	16:34:48	1015	66.5	51.7	0.2
4/22/2019	16:35:48	993	66.3	50.5	0.1
4/22/2019	16:36:48	975	66	50.2	0.2
4/22/2019	16:37:48	961	65.8	50	0.2

4/22/2019	16:38:48	947	65.6	50	0.2
4/22/2019	16:39:48	937	65.3	49.9	0.2
4/22/2019	16:40:48	927	65.3	49.9	0.2
4/22/2019	16:41:48	920	65.2	49.9	0.1
4/22/2019	16:42:48	916	65.3	50.1	0.1
4/22/2019	16:43:48	914	65.6	50.3	0.1
4/22/2019	16:44:48	915	65.9	50.6	0.1
4/22/2019	16:45:48	927	66.2	51.2	0.1
4/22/2019	16:46:48	927	66.5	51.4	0.2
4/22/2019	16:47:48	915	66.6	51.5	0.1
4/22/2019	16:48:48	911	66.4	50.5	0.1
4/22/2019	16:49:48	922	66	49.5	0.1
4/22/2019	16:50:48	940	65.6	49	0.1
4/22/2019	16:51:48	958	65.3	48.9	0.1
4/22/2019	16:52:48	974	65	49.2	0.1
4/22/2019	16:53:48	993	64.9	49.6	0.1
4/22/2019	16:54:48	997	65.1	49.9	0
4/22/2019	16:55:48	999	65.4	50.3	0
4/22/2019	16:56:48	1047	65.7	51.8	0
4/22/2019	16:57:48	1110	66.1	52.7	0
4/22/2019	16:58:48	1124	66.5	53.2	0
4/22/2019	16:59:48	1093	66.7	53	0
4/22/2019	17:00:48	1131	66.6	51.3	0.1
4/22/2019	17:01:48	1119	66.3	50.1	0.1
4/22/2019	17:02:48	1106	65.8	49.6	0.2
4/22/2019	17:03:48	1091	65.5	49.3	0.1
4/22/2019	17:04:48	1080	65	49	0.2
4/22/2019	17:05:48	1069	64.7	48.8	0.3
4/22/2019	17:06:48	1063	64.9	49.1	0.2
4/22/2019	17:07:48	1063	65.1	49.3	0.2
4/22/2019	17:08:48	1067	65.5	49.5	0.2
4/22/2019	17:09:48	1069	65.8	49.9	0.4
4/22/2019	17:10:48	1074	66.2	50.6	0.6
4/22/2019	17:11:48	1063	66.5	51.5	0.6

4/22/2019	17:12:48	1036	66.7	51.2	0.7
4/22/2019	17:13:48	1021	66.6	50.3	0.9
4/22/2019	17:14:48	1016	66.4	49.9	0.8
4/22/2019	17:15:48	1012	66.1	49.7	0.8
4/22/2019	17:16:48	1010	65.8	49.7	0.7
4/22/2019	17:17:48	1004	65.7	49.8	0.6
4/22/2019	17:18:48	1000	65.4	49.7	0.5
4/22/2019	17:19:48	1002	65.1	49.2	0.4
4/22/2019	17:20:48	1002	65.2	49.4	0.4
4/22/2019	17:21:48	1002	65.4	49.6	0.3
4/22/2019	17:22:48	1007	65.7	49.9	0.3
4/22/2019	17:23:48	1018	66	50.2	0.3
4/22/2019	17:24:48	1032	66.4	50.9	0.3
4/22/2019	17:25:48	1036	66.6	51.5	0.5
4/22/2019	17:26:48	1026	66.7	50.9	0.5
4/22/2019	17:27:48	1019	66.6	50.3	0.4
4/22/2019	17:28:48	1012	66.3	50	0.3
4/22/2019	17:29:48	1007	66.1	49.8	0.3
4/22/2019	17:30:48	1006	65.8	49.7	0.3
4/22/2019	17:31:48	1000	65.5	49.8	0.2
4/22/2019	17:32:48	995	65.4	49.8	0.2
4/22/2019	17:33:48	991	65.4	49.8	0.2
4/22/2019	17:34:48	986	65.5	50	0.1
4/22/2019	17:35:48	983	65.8	50.4	0.1
4/22/2019	17:36:48	981	66.1	51.1	0.1
4/22/2019	17:37:47	989	66.4	52	0.1
4/22/2019	17:38:47	993	66.7	52.2	0.1
4/22/2019	17:39:47	994	67	52	0.1
4/22/2019	17:40:47	986	67.1	51.8	0.1
4/22/2019	17:41:47	977	66.7	50.5	0.1
4/22/2019	17:42:47	980	66.4	49.4	0.2
4/22/2019	17:43:47	980	66.1	48.8	0.2
4/22/2019	17:44:47	978	65.8	48.6	0.1
4/22/2019	17:45:47	974	65.5	48.9	0.1

4/22/2019	17:46:47	972	65.3	49	0.1
4/22/2019	17:47:47	970	65.5	49.3	0
4/22/2019	17:48:47	968	65.7	49.4	0
4/22/2019	17:49:47	970	66	50	0
4/22/2019	17:50:47	975	66.4	50.9	0
4/22/2019	17:51:47	983	66.7	51.3	0
4/22/2019	17:52:47	967	67	51.6	0
4/22/2019	17:53:47	965	66.9	50.4	0.1
4/22/2019	17:54:47	975	66.4	49	0.1
4/22/2019	17:55:47	978	66.1	48.5	0.1
4/22/2019	17:56:47	975	65.6	48	0
4/22/2019	17:57:47	981	65.1	47.8	0
4/22/2019	17:58:47	985	64.9	47.7	0
4/22/2019	17:59:47	989	65	48	0
4/22/2019	18:00:47	989	65.3	48.4	0
4/22/2019	18:01:47	1000	65.6	49.3	0
4/22/2019	18:02:47	1018	66	50.4	0
4/22/2019	18:03:47	1019	66.3	50.1	0
4/22/2019	18:04:47	1009	66.6	50.2	0
4/22/2019	18:05:47	986	66.8	50.7	0
4/22/2019	18:06:47	973	66.7	49.9	0
4/22/2019	18:07:47	959	66.5	49.5	0
4/22/2019	18:08:47	955	66.2	49	0
4/22/2019	18:09:47	954	65.8	48.3	0
4/22/2019	18:10:47	953	65.4	47.9	0
4/22/2019	18:11:47	948	65.1	47.7	0
4/22/2019	18:12:47	944	65.1	48	0
4/22/2019	18:13:47	940	65.3	48.4	0
4/22/2019	18:14:47	944	65.6	48.8	0
4/22/2019	18:15:47	952	66	49	0
4/22/2019	18:16:47	955	66.3	49.3	0
4/22/2019	18:17:47	953	66.6	49.9	0
4/22/2019	18:18:47	941	66.8	50.4	0
4/22/2019	18:19:47	942	66.6	49.4	0

4/22/2019	18:20:47	936	66.3	48.8	0
4/22/2019	18:21:47	933	66	48.6	0
4/22/2019	18:22:47	930	65.7	48.6	0
4/22/2019	18:23:47	927	65.5	48.6	0
4/22/2019	18:24:47	926	65.3	48.6	0
4/22/2019	18:25:47	922	65.3	48.7	0
4/22/2019	18:26:47	922	65.4	48.8	0
4/22/2019	18:27:47	921	65.7	48.9	0
4/22/2019	18:28:47	927	66	49.2	0
4/22/2019	18:29:47	943	66.4	49.4	0
4/22/2019	18:30:47	951	66.6	49.8	0
4/22/2019	18:31:47	955	66.6	49.6	0
4/22/2019	18:32:47	951	66.3	48.1	0
4/22/2019	18:33:47	947	66	47.6	0
4/22/2019	18:34:47	942	65.6	47.3	0
4/22/2019	18:35:47	936	65.3	47.5	0
4/22/2019	18:36:47	936	65.1	47.7	0
4/22/2019	18:37:47	936	65.1	47.9	0
4/22/2019	18:38:47	935	65.3	48.1	0
4/22/2019	18:39:47	937	65.6	48.3	0
4/22/2019	18:40:47	944	66	48.8	0
4/22/2019	18:41:47	952	66.3	49.2	0
4/22/2019	18:42:47	959	66.6	50.3	0
4/22/2019	18:43:47	1005	66.7	50.1	0
4/22/2019	18:44:47	1027	66.5	48.5	0
4/22/2019	18:45:47	1032	66	47.9	0
4/22/2019	18:46:47	1033	65.5	47.6	0
4/22/2019	18:47:47	1040	65.1	47.6	0
4/22/2019	18:48:47	1062	64.7	47.5	0
4/22/2019	18:49:47	1064	64.8	47.6	0
4/22/2019	18:50:47	1065	65	47.9	0
4/22/2019	18:51:47	1067	65.3	48.2	0
4/22/2019	18:52:47	1073	65.7	48.3	0
4/22/2019	18:53:47	1122	66	48.9	0

4/22/2019	18:54:47	1148	66.4	50.1	0
4/22/2019	18:55:47	1170	66.7	51.7	0
4/22/2019	18:56:47	1150	66.7	51.1	0
4/22/2019	18:57:47	1153	66.4	50.2	0
4/22/2019	18:58:47	1152	66.2	49.8	0
4/22/2019	18:59:47	1146	65.9	49.5	0
4/22/2019	19:00:47	1133	65.6	49.4	0
4/22/2019	19:01:47	1118	65.3	48.9	0
4/22/2019	19:02:47	1105	65.1	48.5	0
4/22/2019	19:03:47	1099	65.3	48.7	0
4/22/2019	19:04:47	1098	65.5	49.1	0
4/22/2019	19:05:47	1105	65.8	49.5	0
4/22/2019	19:06:47	1110	66.2	49.7	0
4/22/2019	19:07:47	1122	66.5	50.5	0
4/22/2019	19:08:47	1131	66.7	51.7	0
4/22/2019	19:09:47	1148	67	52.3	0
4/22/2019	19:10:47	1156	67.2	52.2	0
4/22/2019	19:11:47	1178	67.2	52.3	0
4/22/2019	19:12:47	1180	66.9	51.3	0
4/22/2019	19:13:47	1172	66.7	50.7	0
4/22/2019	19:14:47	1163	66.4	50.3	0
4/22/2019	19:15:47	1159	66.2	49.9	0
4/22/2019	19:16:47	1151	65.8	49.6	0
4/22/2019	19:17:47	1148	65.6	49.6	0
4/22/2019	19:18:47	1149	65.5	49.7	0
4/22/2019	19:19:47	1145	65.6	50	0
4/22/2019	19:20:47	1147	65.8	51.1	0
4/22/2019	19:21:47	1156	66.2	51.5	0
4/22/2019	19:22:47	1154	66.5	51.5	0
4/22/2019	19:23:47	1149	66.7	51.6	0
4/22/2019	19:24:47	1122	66.6	50.8	0
4/22/2019	19:25:47	1101	66.3	49.4	0
4/22/2019	19:26:47	1084	65.9	48.6	0
4/22/2019	19:27:47	1073	65.5	48.1	0



4/22/2019	19:28:47	1061	65.2	47.9	0
4/22/2019	19:29:47	1047	64.9	48.1	0
4/22/2019	19:30:47	1036	65	48.3	0
4/22/2019	19:31:47	1032	65.2	48.5	0
4/22/2019	19:32:47	1026	65.5	49.1	0
4/22/2019	19:33:47	1011	65.9	49.9	0
4/22/2019	19:34:47	995	66.2	50	0
4/22/2019	19:35:47	973	66.5	50.6	0
4/22/2019	19:36:47	953	66.6	49.4	0
4/22/2019	19:37:47	935	66.3	47.6	0
4/22/2019	19:38:47	926	65.8	46.9	0
4/22/2019	19:39:47	921	65.3	46.7	0
4/22/2019	19:40:47	916	64.9	46.4	0
4/22/2019	19:41:47	908	64.4	46.3	0
4/22/2019	19:42:47	906	64.6	46.6	0
4/22/2019	19:43:47	904	64.8	46.9	0
4/22/2019	19:44:47	904	65.1	46.8	0
4/22/2019	19:45:47	902	65.5	46.8	0
4/22/2019	19:46:47	903	65.9	46.5	0
4/22/2019	19:47:47	903	66.2	47.4	0
4/22/2019	19:48:47	914	66.4	48	0
4/22/2019	19:49:47	924	66.3	47.8	0
4/22/2019	19:50:47	934	66.1	47.1	0
4/22/2019	19:51:47	932	65.7	47	0
4/22/2019	19:52:47	928	65.4	47	0
4/22/2019	19:53:47	921	65.1	47.1	0
4/22/2019	19:54:47	914	64.9	47.1	0
4/22/2019	19:55:47	906	64.9	47.1	0
4/22/2019	19:56:47	905	65.1	47.3	0
4/22/2019	19:57:47	905	65.3	47.4	0
4/22/2019	19:58:47	904	65.7	47.3	0
4/22/2019	19:59:47	901	66	47.4	0
4/22/2019	20:00:47	901	66.2	47.2	0
4/22/2019	20:01:47	893	66.5	47.9	0

4/22/2019	20:02:47	891	66.7	48.2	0
4/22/2019	20:03:47	883	66.8	48.6	0
4/22/2019	20:04:47	872	66.5	48.2	0
4/22/2019	20:05:47	866	66.1	47.1	0
4/22/2019	20:06:47	862	65.6	46.6	0
4/22/2019	20:07:47	856	65.2	46.8	0
4/22/2019	20:08:47	850	65	46.9	0
4/22/2019	20:09:47	846	65.1	47.2	0
4/22/2019	20:10:47	842	65.3	47.3	0
4/22/2019	20:11:47	840	65.6	47.5	0
4/22/2019	20:12:47	832	65.9	48.1	0
4/22/2019	20:13:47	821	66.2	48.8	0
4/22/2019	20:14:47	807	66.4	49.1	0
4/22/2019	20:15:47	803	66.6	48.7	0
4/22/2019	20:16:47	791	66.7	48.9	0
4/22/2019	20:17:47	783	66.5	48.5	0
4/22/2019	20:18:47	785	66.1	47.1	0
4/22/2019	20:19:47	791	65.5	46.5	0
4/22/2019	20:20:47	802	65.1	46.1	0
4/22/2019	20:21:47	812	64.9	46	0
4/22/2019	20:22:47	814	64.9	46.4	0
4/22/2019	20:23:47	814	65.1	46.7	0
4/22/2019	20:24:47	816	65.4	46.7	0
4/22/2019	20:25:47	820	65.7	46.6	0
4/22/2019	20:26:47	827	66	46.4	0
4/22/2019	20:27:47	906	66.3	47.6	0
4/22/2019	20:28:47	965	66.5	49.1	0
4/22/2019	20:29:47	1015	66.5	49.8	0
4/22/2019	20:30:47	1061	66.3	48.8	0
4/22/2019	20:31:47	1072	66	48.5	0
4/22/2019	20:32:47	1086	65.5	48.3	0
4/22/2019	20:33:47	1101	65.1	47.9	0
4/22/2019	20:34:47	1116	64.7	47.6	0
4/22/2019	20:35:47	1124	64.8	47.8	0

4/22/2019	20:36:47	1127	64.9	48	0
4/22/2019	20:37:47	1132	65.2	48.2	0
4/22/2019	20:38:47	1196	65.5	49.2	0
4/22/2019	20:39:47	1260	65.8	49.6	0
4/22/2019	20:40:47	1285	66.1	50.2	0
4/22/2019	20:41:47	1299	66.4	50.7	0
4/22/2019	20:42:47	1336	66.6	51.1	0
4/22/2019	20:43:47	1351	66.5	52	0
4/22/2019	20:44:47	1327	66.3	50.9	0
4/22/2019	20:45:47	1301	65.8	49.6	0
4/22/2019	20:46:47	1276	65.4	49.2	0
4/22/2019	20:47:47	1254	65	49.3	0
4/22/2019	20:48:47	1241	65	49.5	0
4/22/2019	20:49:47	1241	65.2	49.7	0
4/22/2019	20:50:47	1230	65.4	50	0
4/22/2019	20:51:47	1230	65.7	51.2	0
4/22/2019	20:52:47	1219	66	51.5	0
4/22/2019	20:53:47	1218	66.3	52.5	0
4/22/2019	20:54:47	1215	66.5	52.5	0
4/22/2019	20:55:47	1215	66.7	52.1	0
4/22/2019	20:56:47	1197	66.5	51.9	0
4/22/2019	20:57:47	1174	66.1	50.3	0
4/22/2019	20:58:47	1161	65.8	49.3	0
4/22/2019	20:59:47	1152	65.2	48.5	0
4/22/2019	21:00:47	1141	64.9	47.9	0
4/22/2019	21:01:47	1136	64.9	48.2	0
4/22/2019	21:02:47	1135	65	48.4	0
4/22/2019	21:03:47	1132	65.3	48.6	0
4/22/2019	21:04:47	1141	65.6	48.7	0
4/22/2019	21:05:47	1152	65.9	49	0
4/22/2019	21:06:47	1151	66.2	49.1	0
4/22/2019	21:07:47	1154	66.4	49.5	0
4/22/2019	21:08:47	1163	66.6	49.9	0
4/22/2019	21:09:47	1164	66.5	50.6	0

4/22/2019	21:10:47	1151	66.3	50.2	0
4/22/2019	21:11:47	1134	66	49.4	0
4/22/2019	21:12:47	1122	65.6	49	0
4/22/2019	21:13:47	1109	65.2	48.7	0
4/22/2019	21:14:47	1097	64.9	48.4	0
4/22/2019	21:15:47	1093	65	48.7	0
4/22/2019	21:16:47	1091	65.1	48.9	0
4/22/2019	21:17:47	1091	65.4	49.2	0
4/22/2019	21:18:47	1094	65.7	49.4	0
4/22/2019	21:19:47	1095	66	49.3	0
4/22/2019	21:20:47	1098	66.2	49.6	0
4/22/2019	21:21:47	1103	66.4	50.1	0
4/22/2019	21:22:47	1101	66.6	50.3	0
4/22/2019	21:23:47	1101	66.6	50.5	0.1
4/22/2019	21:24:47	1094	66.2	49.4	0
4/22/2019	21:25:47	1088	65.5	48.2	0
4/22/2019	21:26:47	1079	65	47.6	0
4/22/2019	21:27:47	1071	64.4	47.6	0
4/22/2019	21:28:47	1066	64.6	48	0
4/22/2019	21:29:47	1060	64.8	48.3	0
4/22/2019	21:30:47	1053	65.1	48.7	0
4/22/2019	21:31:47	1058	65.4	49.6	0
4/22/2019	21:32:47	1057	65.7	49.9	0
4/22/2019	21:33:47	1048	66	49.9	0
4/22/2019	21:34:47	1035	66.2	50.2	0
4/22/2019	21:35:47	1022	66.4	49.9	0
4/22/2019	21:36:47	1027	66.5	50	0
4/22/2019	21:37:47	1024	66.2	49.5	0
4/22/2019	21:38:47	1020	65.8	48.2	0
4/22/2019	21:39:47	1018	65.3	47.4	0
4/22/2019	21:40:47	1013	64.5	46.8	0
4/22/2019	21:41:47	1011	64.5	47	0
4/22/2019	21:42:47	1007	64.6	47.4	0
4/22/2019	21:43:47	1005	64.9	47.5	0

4/22/2019	21:44:47	1004	65.2	47.4	0
4/22/2019	21:45:47	1005	65.5	47.3	0
4/22/2019	21:46:47	1007	65.8	47.3	0
4/22/2019	21:47:47	1010	66	47.5	0
4/22/2019	21:48:47	1016	66.2	47.7	0
4/22/2019	21:49:47	1020	66.3	48.4	0
4/22/2019	21:50:47	1027	66	48.7	0
4/22/2019	21:51:47	1023	65.8	48.2	0
4/22/2019	21:52:47	1018	65.3	47.9	0
4/22/2019	21:53:47	1018	65	47.8	0
4/22/2019	21:54:47	1019	64.6	47.8	0
4/22/2019	21:55:47	1021	64.7	48.2	0
4/22/2019	21:56:47	1019	64.9	48.4	0
4/22/2019	21:57:47	1022	65.1	48.8	0
4/22/2019	21:58:47	1026	65.4	49.4	0
4/22/2019	21:59:47	1029	65.7	50.1	0
4/22/2019	22:00:47	1029	65.9	50.9	0
4/22/2019	22:01:47	1026	66.1	50.5	0
4/22/2019	22:02:47	1033	66.3	51.8	0
4/22/2019	22:03:47	1065	66.5	53.1	0
4/22/2019	22:04:47	1162	66.2	53.5	0.2
4/22/2019	22:05:47	1221	65.9	52.3	0.3
4/22/2019	22:06:47	1244	65.4	51.6	0.4
4/22/2019	22:07:47	1251	65	51.1	0.4
4/22/2019	22:08:47	1253	64.6	50.6	0.4
4/22/2019	22:09:47	1248	64.7	50.8	0.3
4/22/2019	22:10:47	1244	64.7	51	0.3
4/22/2019	22:11:47	1245	65	51.3	0.2
4/22/2019	22:12:47	1245	65.3	52	0.3
4/22/2019	22:13:47	1252	65.6	53	0.3
4/22/2019	22:14:47	1251	65.8	53.9	0.3
4/22/2019	22:15:47	1224	66.1	54.8	0.3
4/22/2019	22:16:47	1200	66.2	55.1	0.2
4/22/2019	22:17:47	1170	66.4	53.7	0.1

4/22/2019	22:18:47	1162	66.5	53.4	0.1
4/22/2019	22:19:47	1136	66.3	54	0.1
4/22/2019	22:20:47	1116	65.9	52.4	0.1
4/22/2019	22:21:47	1104	65.4	50.9	0.1
4/22/2019	22:22:47	1096	64.8	49.9	0.1
4/22/2019	22:23:47	1091	64.6	49.8	0
4/22/2019	22:24:47	1086	64.7	50.2	0
4/22/2019	22:25:47	1085	64.9	50.3	0
4/22/2019	22:26:47	1084	65.2	50.2	0
4/22/2019	22:27:47	1082	65.4	50	0
4/22/2019	22:28:47	1081	65.7	49.9	0
4/22/2019	22:29:47	1081	65.9	49.8	0.1
4/22/2019	22:30:47	1078	66.1	49.6	0.1
4/22/2019	22:31:47	1073	66.2	49.9	0.1
4/22/2019	22:32:47	1049	66	50.5	0.1
4/22/2019	22:33:47	1031	65.6	49.6	0
4/22/2019	22:34:47	1023	65.2	49.1	0.1
4/22/2019	22:35:47	1010	64.8	48.9	0.1
4/22/2019	22:36:47	1003	64.6	49	0
4/22/2019	22:37:47	999	64.7	49.4	0
4/22/2019	22:38:47	995	64.9	49.4	0
4/22/2019	22:39:47	985	65.2	49.6	0
4/22/2019	22:40:47	974	65.4	50	0
4/22/2019	22:41:47	970	65.7	49.7	0
4/22/2019	22:42:47	965	65.9	49.6	0
4/22/2019	22:43:47	961	66	49.6	0
4/22/2019	22:44:47	953	66.2	49.6	0
4/22/2019	22:45:47	945	66.3	49.5	0
4/22/2019	22:46:47	936	66.4	49.7	0
4/22/2019	22:47:47	916	66.1	50.3	0
4/22/2019	22:48:47	909	65.7	48.9	0
4/22/2019	22:49:47	906	65	47.8	0
4/22/2019	22:50:47	907	64.6	47.3	0
4/22/2019	22:51:47	905	64.6	47.8	0



4/22/2019	22:52:47	905	64.7	48.1	0
4/22/2019	22:53:47	901	65	48.1	0
4/22/2019	22:54:47	900	65.2	48.1	0
4/22/2019	22:55:47	901	65.5	47.9	0
4/22/2019	22:56:47	901	65.7	47.9	0
4/22/2019	22:57:47	902	65.8	48.5	0
4/22/2019	22:58:47	904	66	49.3	0
4/22/2019	22:59:47	906	66.1	49.4	0
4/22/2019	23:00:47	907	65.9	49	0
4/22/2019	23:01:47	900	65.6	48.1	0
4/22/2019	23:02:47	894	65.2	47.8	0
4/22/2019	23:03:47	889	64.9	47.9	0
4/22/2019	23:04:47	888	64.8	48	0
4/22/2019	23:05:47	893	64.9	48.4	0
4/22/2019	23:06:47	916	65	49	0
4/22/2019	23:07:47	933	65.2	49.1	0
4/22/2019	23:08:47	953	65.4	49.1	0
4/22/2019	23:09:47	968	65.6	49	0
4/22/2019	23:10:47	1020	65.8	49.3	0
4/22/2019	23:11:47	1055	65.9	49.2	0
4/22/2019	23:12:47	1094	65.9	49.2	0
4/22/2019	23:13:47	1111	65.6	48.4	0
4/22/2019	23:14:47	1092	65.1	47.3	0
4/22/2019	23:15:47	1071	64.4	47	0
4/22/2019	23:16:47	1052	64.2	46.9	0
4/22/2019	23:17:47	1044	64.2	47.4	0
4/22/2019	23:18:47	1044	64.2	47.7	0
4/22/2019	23:19:47	1052	64.4	47.8	0
4/22/2019	23:20:47	1055	64.6	47.7	0
4/22/2019	23:21:47	1056	64.8	47.6	0
4/22/2019	23:22:47	1056	65	47.6	0
4/22/2019	23:23:47	1063	65.2	47.5	0
4/22/2019	23:24:47	1073	65.4	47.6	0
4/22/2019	23:25:47	1079	65.6	47.8	0

4/22/2019	23:26:47	1076	65.5	47.1	0
4/22/2019	23:27:47	1060	64.9	46.1	0
4/22/2019	23:28:47	1034	64	46	0
4/22/2019	23:29:47	1019	64	46.5	0
4/22/2019	23:30:47	1022	64	47	0
4/22/2019	23:31:47	1026	64.2	47.2	0
4/22/2019	23:32:47	1037	64.4	47.3	0
4/22/2019	23:33:47	1046	64.5	47.2	0
4/22/2019	23:34:47	1053	64.7	47.4	0
4/22/2019	23:35:47	1058	64.8	47.7	0
4/22/2019	23:36:47	1062	64.9	47.6	0
4/22/2019	23:37:47	1070	65.1	47.5	0
4/22/2019	23:38:47	1076	65.2	47.7	0
4/22/2019	23:39:46	1084	65.3	47.8	0
4/22/2019	23:40:46	1092	65.3	47.7	0
4/22/2019	23:41:46	1094	65.1	47.9	0
4/22/2019	23:42:46	1065	64.5	47.5	0
4/22/2019	23:43:46	1041	63.8	47.2	0
4/22/2019	23:44:46	1022	63.6	47.1	0
4/22/2019	23:45:46	1023	63.6	47.5	0
4/22/2019	23:46:46	1022	63.7	47.8	0
4/22/2019	23:47:46	1026	63.9	47.9	0
4/22/2019	23:48:46	1032	64.1	48	0
4/22/2019	23:49:46	1033	64.3	47.9	0
4/22/2019	23:50:46	1026	64.6	47.9	0
4/22/2019	23:51:46	1005	64.8	48.1	0
4/22/2019	23:52:46	1003	64.9	48	0
4/22/2019	23:53:46	1011	64.9	48.1	0
4/22/2019	23:54:46	992	64.6	47.5	0
4/22/2019	23:55:46	963	64	46.4	0
4/22/2019	23:56:46	943	63.6	47.5	0
4/22/2019	23:57:46	930	63.5	51.2	0
4/22/2019	23:58:46	925	63.6	55	0
4/22/2019	23:59:46	922	63.6	56.7	0

4/23/2019	0:00:46	922	63.8	56.5	0
4/23/2019	0:01:46	924	64	56.1	0
4/23/2019	0:02:46	926	64.2	55.5	0
4/23/2019	0:03:46	929	64.4	54.8	0
4/23/2019	0:04:46	932	64.6	54.3	0
4/23/2019	0:05:46	938	64.8	53.9	0
4/23/2019	0:06:46	946	64.9	53.4	0
4/23/2019	0:07:46	963	64.9	52.8	0
4/23/2019	0:08:46	979	64.6	51.3	0
4/23/2019	0:09:46	971	64	50.3	0
4/23/2019	0:10:46	957	63.5	49.7	0
4/23/2019	0:11:46	950	63.5	50	0
4/23/2019	0:12:46	938	63.6	50.2	0
4/23/2019	0:13:46	937	63.8	50.2	0
4/23/2019	0:14:46	940	63.9	50.1	0
4/23/2019	0:15:46	940	64.1	49.9	0
4/23/2019	0:16:46	944	64.3	49.8	0
4/23/2019	0:17:46	937	64.5	49.8	0
4/23/2019	0:18:46	931	64.7	49.8	0
4/23/2019	0:19:46	945	64.8	50	0
4/23/2019	0:20:46	967	64.9	50.3	0
4/23/2019	0:21:46	987	64.8	50.5	0
4/23/2019	0:22:46	950	64.3	49	0
4/23/2019	0:23:46	924	63.8	48.6	0
4/23/2019	0:24:46	909	63.6	49	0
4/23/2019	0:25:46	905	63.6	49.3	0
4/23/2019	0:26:46	905	63.7	49.4	0
4/23/2019	0:27:46	909	63.9	49.4	0
4/23/2019	0:28:46	912	64	49.3	0
4/23/2019	0:29:46	917	64.2	49.3	0
4/23/2019	0:30:46	924	64.4	49.4	0
4/23/2019	0:31:46	933	64.5	49.3	0
4/23/2019	0:32:46	941	64.6	49.3	0
4/23/2019	0:33:46	944	64.7	49.3	0

4/23/2019	0:34:46	949	64.8	49.4	0
4/23/2019	0:35:46	959	64.9	49.3	0
4/23/2019	0:36:46	965	64.8	49.5	0
4/23/2019	0:37:46	931	64.3	48.6	0
4/23/2019	0:38:46	901	63.9	47.8	0
4/23/2019	0:39:46	884	63.7	49	0
4/23/2019	0:40:46	870	63.6	52.8	0
4/23/2019	0:41:46	859	63.6	55.9	0
4/23/2019	0:42:46	851	63.6	57	0
4/23/2019	0:43:46	847	63.8	56.9	0
4/23/2019	0:44:46	846	63.9	56.6	0
4/23/2019	0:45:46	855	64.1	56.3	0
4/23/2019	0:46:46	862	64.2	56	0
4/23/2019	0:47:46	871	64.4	55.7	0
4/23/2019	0:48:46	884	64.5	55.5	0
4/23/2019	0:49:46	892	64.6	55.1	0
4/23/2019	0:50:46	903	64.6	54.3	0
4/23/2019	0:51:46	907	64.3	52.2	0
4/23/2019	0:52:46	897	63.6	51.3	0
4/23/2019	0:53:46	885	63.3	50.9	0
4/23/2019	0:54:46	879	63.2	51.1	0
4/23/2019	0:55:46	876	63.4	51.2	0
4/23/2019	0:56:46	876	63.5	51.1	0
4/23/2019	0:57:46	879	63.7	51	0
4/23/2019	0:58:46	880	63.9	50.8	0
4/23/2019	0:59:46	882	64.1	50.6	0
4/23/2019	1:00:46	887	64.2	50.5	0
4/23/2019	1:01:46	895	64.4	50.4	0
4/23/2019	1:02:46	913	64.5	50.5	0
4/23/2019	1:03:46	938	64.5	50.6	0
4/23/2019	1:04:46	928	64.1	49.4	0
4/23/2019	1:05:46	909	63.3	49.1	0
4/23/2019	1:06:46	897	63.1	49.2	0
4/23/2019	1:07:46	880	63.1	49.5	0

4/23/2019	1:08:46	878	63.2	49.6	0
4/23/2019	1:09:46	880	63.4	49.6	0
4/23/2019	1:10:46	885	63.5	49.5	0
4/23/2019	1:11:46	895	63.7	49.5	0
4/23/2019	1:12:46	904	63.9	49.6	0
4/23/2019	1:13:46	914	64	49.7	0
4/23/2019	1:14:46	920	64.1	49.6	0
4/23/2019	1:15:46	926	64.2	49.5	0
4/23/2019	1:16:46	944	64.2	49.8	0
4/23/2019	1:17:46	927	63.7	48.9	0
4/23/2019	1:18:46	890	63.2	48.2	0
4/23/2019	1:19:46	872	62.9	50.6	0
4/23/2019	1:20:46	854	62.9	54	0
4/23/2019	1:21:46	850	62.9	57.1	0
4/23/2019	1:22:46	856	63.1	57.8	0
4/23/2019	1:23:46	854	63.3	57.5	0
4/23/2019	1:24:46	853	63.5	57.2	0
4/23/2019	1:25:46	856	63.7	56.8	0
4/23/2019	1:26:46	867	63.8	56.4	0
4/23/2019	1:27:46	878	64	56.1	0
4/23/2019	1:28:46	891	64.1	55.8	0
4/23/2019	1:29:46	902	64.3	55.8	0
4/23/2019	1:30:46	914	64.3	55.6	0
4/23/2019	1:31:46	921	64	53.4	0
4/23/2019	1:32:46	912	63.5	52.1	0
4/23/2019	1:33:46	898	62.8	51.3	0
4/23/2019	1:34:46	886	62.8	51.5	0
4/23/2019	1:35:46	879	63	51.6	0
4/23/2019	1:36:46	879	63.1	51.6	0
4/23/2019	1:37:46	883	63.3	51.7	0
4/23/2019	1:38:46	886	63.5	51.5	0
4/23/2019	1:39:46	892	63.6	51.3	0
4/23/2019	1:40:46	924	63.8	51.4	0
4/23/2019	1:41:46	961	64	51.6	0

4/23/2019	1:42:46	991	64.1	51.8	0
4/23/2019	1:43:46	1006	64.2	51.8	0
4/23/2019	1:44:46	978	63.9	51.2	0
4/23/2019	1:45:46	937	63.2	49.5	0
4/23/2019	1:46:46	901	62.3	49.6	0
4/23/2019	1:47:46	890	62.5	50.7	0
4/23/2019	1:48:46	881	62.6	51.2	0
4/23/2019	1:49:46	877	62.8	51.4	0
4/23/2019	1:50:46	881	63	51.3	0
4/23/2019	1:51:46	883	63.2	51.1	0
4/23/2019	1:52:46	893	63.4	50.9	0
4/23/2019	1:53:46	902	63.6	50.9	0
4/23/2019	1:54:46	915	63.7	50.9	0
4/23/2019	1:55:46	926	63.9	50.9	0
4/23/2019	1:56:46	946	64	51	0
4/23/2019	1:57:46	971	64	51.4	0
4/23/2019	1:58:46	954	63.8	50.9	0
4/23/2019	1:59:46	910	62.9	49.3	0
4/23/2019	2:00:46	886	62.7	49.8	0
4/23/2019	2:01:46	875	62.8	50.7	0
4/23/2019	2:02:46	872	62.8	51.1	0
4/23/2019	2:03:46	870	63	51.1	0
4/23/2019	2:04:46	872	63.2	51	0
4/23/2019	2:05:46	880	63.4	50.9	0
4/23/2019	2:06:46	909	63.5	51	0
4/23/2019	2:07:46	962	63.7	51.4	0
4/23/2019	2:08:46	977	63.9	51.6	0
4/23/2019	2:09:46	1002	64	51.8	0
4/23/2019	2:10:46	1017	64.1	51.8	0
4/23/2019	2:11:46	990	64	51.8	0
4/23/2019	2:12:46	939	63.6	50.4	0
4/23/2019	2:13:46	902	62.9	49.4	0
4/23/2019	2:14:46	885	62.6	50.6	0
4/23/2019	2:15:46	878	62.7	51.2	0



4/23/2019	2:16:46	879	62.8	51.4	0
4/23/2019	2:17:46	882	62.9	51.4	0
4/23/2019	2:18:46	932	63.2	52.7	0
4/23/2019	2:19:46	894	63.5	54.8	0
4/23/2019	2:20:46	846	63.9	56.5	0
4/23/2019	2:21:46	824	64.3	56.8	0
4/23/2019	2:22:46	813	64.6	57	0
4/23/2019	2:23:46	807	64.8	57	0
4/23/2019	2:24:46	805	65	57.1	0
4/23/2019	2:25:46	800	65.1	56.4	0
4/23/2019	2:26:46	787	64.6	52.7	0
4/23/2019	2:27:46	774	63.9	50.2	0
4/23/2019	2:28:46	770	63.6	50.2	0
4/23/2019	2:29:46	768	63.4	51.5	0
4/23/2019	2:30:46	773	63.6	53.9	0
4/23/2019	2:31:46	781	63.8	55.4	0
4/23/2019	2:32:46	783	64.1	56.1	0
4/23/2019	2:33:46	784	64.4	56.5	0
4/23/2019	2:34:46	782	64.6	56.6	0
4/23/2019	2:35:46	780	64.8	56.5	0.1
4/23/2019	2:36:46	781	65	56.5	0
4/23/2019	2:37:46	780	65.2	56.4	0
4/23/2019	2:38:46	780	65.3	56.3	0
4/23/2019	2:39:46	776	65.4	56.3	0
4/23/2019	2:40:46	773	65.2	54.7	0
4/23/2019	2:41:46	757	64.6	51.4	0
4/23/2019	2:42:46	752	64	49.5	0
4/23/2019	2:43:46	746	63.6	50.5	0
4/23/2019	2:44:46	747	63.6	51.8	0
4/23/2019	2:45:46	756	63.7	54.3	0
4/23/2019	2:46:46	763	64	55.5	0
4/23/2019	2:47:46	764	64.3	56.2	0
4/23/2019	2:48:46	767	64.5	56.5	0
4/23/2019	2:49:46	771	64.8	56.6	0

4/23/2019	2:50:46	776	65	56.5	0
4/23/2019	2:51:46	785	65.1	56.4	0
4/23/2019	2:52:46	841	65.3	56.4	0
4/23/2019	2:53:46	905	65.3	56.2	0
4/23/2019	2:54:46	982	65.3	56.3	0
4/23/2019	2:55:46	959	65.2	55.2	0
4/23/2019	2:56:46	907	64.7	52.3	0
4/23/2019	2:57:46	871	64.2	50.6	0
4/23/2019	2:58:46	855	63.9	51.1	0
4/23/2019	2:59:46	846	63.7	51.8	0
4/23/2019	3:00:46	853	63.7	52.2	0
4/23/2019	3:01:46	867	63.8	52.3	0
4/23/2019	3:02:46	869	63.9	52.2	0
4/23/2019	3:03:46	877	64	52.2	0
4/23/2019	3:04:46	892	64.1	52.4	0
4/23/2019	3:05:46	905	64.2	52.6	0
4/23/2019	3:06:46	930	64.3	52.8	0
4/23/2019	3:07:46	958	64.3	53	0
4/23/2019	3:08:46	976	64.4	53.1	0
4/23/2019	3:09:46	993	64.5	53.3	0
4/23/2019	3:10:46	987	64.4	53.1	0
4/23/2019	3:11:46	939	64.1	51.5	0
4/23/2019	3:12:46	897	63.4	50.1	0
4/23/2019	3:13:46	876	63.3	50.8	0
4/23/2019	3:14:46	861	63.3	51.5	0
4/23/2019	3:15:46	860	63.3	51.7	0
4/23/2019	3:16:46	861	63.4	51.6	0
4/23/2019	3:17:46	865	63.6	51.6	0
4/23/2019	3:18:46	882	63.7	51.7	0
4/23/2019	3:19:46	906	63.8	51.8	0
4/23/2019	3:20:46	931	63.9	52	0
4/23/2019	3:21:46	951	64	52.1	0
4/23/2019	3:22:46	968	64.1	52.3	0
4/23/2019	3:23:46	988	64.2	52.4	0

4/23/2019	3:24:46	1002	64.3	52.5	0
4/23/2019	3:25:46	1008	64.3	52.7	0
4/23/2019	3:26:46	957	64	51.8	0
4/23/2019	3:27:46	902	63.5	50.2	0
4/23/2019	3:28:46	884	63.1	50.8	0
4/23/2019	3:29:46	874	63.1	51.5	0
4/23/2019	3:30:46	877	63.2	51.9	0
4/23/2019	3:31:46	894	63.3	52.1	0
4/23/2019	3:32:46	914	63.4	52.2	0
4/23/2019	3:33:46	938	63.6	52.3	0
4/23/2019	3:34:46	974	63.7	52.6	0
4/23/2019	3:35:46	1005	63.8	52.8	0
4/23/2019	3:36:46	1069	63.9	53.1	0
4/23/2019	3:37:46	1098	64	53.2	0
4/23/2019	3:38:46	1112	64.1	53.2	0
4/23/2019	3:39:46	1132	64.2	53.3	0
4/23/2019	3:40:46	1136	64.3	53.4	0
4/23/2019	3:41:46	1107	64.2	53.4	0
4/23/2019	3:42:46	1008	63.9	51.8	0
4/23/2019	3:43:46	937	63.5	50.6	0
4/23/2019	3:44:46	908	63.3	51.5	0
4/23/2019	3:45:46	900	63.3	52.1	0
4/23/2019	3:46:46	896	63.3	52.1	0
4/23/2019	3:47:46	895	63.4	52.1	0
4/23/2019	3:48:46	898	63.5	52	0
4/23/2019	3:49:46	912	63.6	52.2	0
4/23/2019	3:50:46	952	63.7	52.4	0
4/23/2019	3:51:46	995	63.8	52.7	0
4/23/2019	3:52:46	1013	63.9	52.8	0
4/23/2019	3:53:46	1041	64	52.9	0
4/23/2019	3:54:46	1077	64.1	53.1	0
4/23/2019	3:55:46	1097	64.1	53.4	0
4/23/2019	3:56:46	1012	64	52.9	0
4/23/2019	3:57:46	928	63.6	51.1	0

4/23/2019	3:58:46	890	63.1	50.6	0
4/23/2019	3:59:46	874	63	51.7	0
4/23/2019	4:00:46	870	62.9	52.2	0
4/23/2019	4:01:46	873	63	52.3	0
4/23/2019	4:02:46	874	63.1	52.2	0
4/23/2019	4:03:46	882	63.2	52.2	0
4/23/2019	4:04:46	890	63.4	52.2	0
4/23/2019	4:05:46	905	63.5	52.3	0
4/23/2019	4:06:46	925	63.6	52.5	0
4/23/2019	4:07:46	949	63.7	52.7	0
4/23/2019	4:08:46	973	63.8	52.9	0
4/23/2019	4:09:46	993	63.8	53	0
4/23/2019	4:10:46	1012	63.9	53	0
4/23/2019	4:11:46	987	63.9	53.1	0
4/23/2019	4:12:46	912	63.5	51.8	0
4/23/2019	4:13:46	867	63.2	50.9	0
4/23/2019	4:14:46	845	63	51.9	0
4/23/2019	4:15:46	837	63	52.5	0
4/23/2019	4:16:46	836	63	52.7	0
4/23/2019	4:17:46	838	63.1	52.6	0
4/23/2019	4:18:46	852	63.2	52.6	0
4/23/2019	4:19:46	872	63.3	52.7	0
4/23/2019	4:20:46	892	63.4	52.8	0
4/23/2019	4:21:46	911	63.5	52.8	0
4/23/2019	4:22:46	937	63.6	53	0
4/23/2019	4:23:46	959	63.7	53.2	0
4/23/2019	4:24:46	975	63.8	53.4	0
4/23/2019	4:25:46	992	63.8	53.5	0
4/23/2019	4:26:46	982	63.8	53.6	0
4/23/2019	4:27:46	912	63.5	52.3	0
4/23/2019	4:28:46	871	63.3	51.4	0
4/23/2019	4:29:46	846	63	52.2	0
4/23/2019	4:30:46	839	63	52.6	0
4/23/2019	4:31:46	835	63	52.8	0

4/23/2019	4:32:46	834	63.1	52.7	0
4/23/2019	4:33:46	839	63.2	52.7	0
4/23/2019	4:34:46	856	63.3	52.9	0
4/23/2019	4:35:46	875	63.4	53.1	0
4/23/2019	4:36:46	889	63.5	53.3	0
4/23/2019	4:37:46	912	63.5	53.5	0
4/23/2019	4:38:46	941	63.6	53.8	0
4/23/2019	4:39:46	965	63.7	54	0
4/23/2019	4:40:46	993	63.8	54.2	0
4/23/2019	4:41:46	983	63.7	54.2	0
4/23/2019	4:42:46	905	63.5	52.8	0
4/23/2019	4:43:46	857	63	51.7	0
4/23/2019	4:44:46	833	62.9	52.6	0
4/23/2019	4:45:46	827	62.8	53.1	0
4/23/2019	4:46:46	826	62.9	53.2	0
4/23/2019	4:47:46	823	63	53.1	0
4/23/2019	4:48:46	828	63.1	53.1	0
4/23/2019	4:49:46	847	63.2	53.2	0
4/23/2019	4:50:46	868	63.3	53.4	0
4/23/2019	4:51:46	895	63.3	53.6	0
4/23/2019	4:52:46	924	63.4	53.9	0
4/23/2019	4:53:46	936	63.5	54.1	0
4/23/2019	4:54:46	957	63.6	54.3	0
4/23/2019	4:55:46	968	63.7	54.5	0
4/23/2019	4:56:46	969	63.7	54.6	0
4/23/2019	4:57:46	901	63.5	53.6	0
4/23/2019	4:58:46	865	63.1	52	0
4/23/2019	4:59:46	844	62.9	52.6	0
4/23/2019	5:00:46	837	62.8	53.2	0
4/23/2019	5:01:46	833	62.8	53.4	0
4/23/2019	5:02:46	832	62.9	53.3	0
4/23/2019	5:03:46	839	63	53.4	0
4/23/2019	5:04:46	848	63.1	53.5	0
4/23/2019	5:05:46	875	63.2	53.9	0

4/23/2019	5:06:46	922	63.3	55	0
4/23/2019	5:07:46	931	63.5	55.3	0
4/23/2019	5:08:46	923	63.6	55.2	0
4/23/2019	5:09:46	923	63.7	55.2	0
4/23/2019	5:10:46	918	63.8	55.2	0
4/23/2019	5:11:46	909	63.8	55.1	0
4/23/2019	5:12:46	880	63.7	54.7	0
4/23/2019	5:13:46	815	63.3	52.8	0
4/23/2019	5:14:46	775	63	51.7	0
4/23/2019	5:15:46	757	62.8	52.6	0
4/23/2019	5:16:46	750	62.7	53.2	0
4/23/2019	5:17:46	747	62.7	53.4	0
4/23/2019	5:18:46	747	62.8	53.4	0
4/23/2019	5:19:46	745	62.9	53.3	0
4/23/2019	5:20:46	745	63	53.3	0
4/23/2019	5:21:46	743	63.1	53.2	0
4/23/2019	5:22:46	743	63.2	53.2	0
4/23/2019	5:23:46	743	63.2	53.2	0
4/23/2019	5:24:46	742	63.3	53.3	0
4/23/2019	5:25:46	743	63.4	53.5	0
4/23/2019	5:26:46	741	63.4	53.5	0
4/23/2019	5:27:46	737	63.5	53.6	0
4/23/2019	5:28:46	719	63.2	52.6	0
4/23/2019	5:29:46	706	62.8	51.2	0
4/23/2019	5:30:46	695	62.5	51.9	0
4/23/2019	5:31:46	691	62.4	52.6	0
4/23/2019	5:32:46	690	62.4	53.1	0
4/23/2019	5:33:46	691	62.5	53.1	0
4/23/2019	5:34:46	690	62.6	53.1	0
4/23/2019	5:35:46	691	62.8	52.9	0
4/23/2019	5:36:46	691	62.9	52.9	0
4/23/2019	5:37:46	689	62.9	52.8	0
4/23/2019	5:38:46	690	63	52.9	0
4/23/2019	5:39:45	690	63	53.1	0



4/23/2019	5:40:45	689	63.1	53.1	0
4/23/2019	5:41:45	689	63.2	53.2	0
4/23/2019	5:42:45	690	63.2	53.4	0
4/23/2019	5:43:45	691	63.3	53.5	0
4/23/2019	5:44:45	685	63	52.5	0
4/23/2019	5:45:45	695	62.7	51.5	0
4/23/2019	5:46:45	745	62.5	52.6	0
4/23/2019	5:47:45	762	62.5	53.3	0
4/23/2019	5:48:45	765	62.6	53.5	0
4/23/2019	5:49:45	780	62.7	53.6	0
4/23/2019	5:50:45	797	62.7	53.6	0
4/23/2019	5:51:45	810	62.8	53.7	0
4/23/2019	5:52:45	822	62.9	53.8	0
4/23/2019	5:53:45	838	63	53.9	0
4/23/2019	5:54:45	854	63.1	54	0
4/23/2019	5:55:45	868	63.2	54.1	0
4/23/2019	5:56:45	887	63.3	54.4	0
4/23/2019	5:57:45	899	63.4	54.4	0
4/23/2019	5:58:45	909	63.4	54.6	0
4/23/2019	5:59:45	917	63.4	54.7	0
4/23/2019	6:00:45	875	63.2	53.6	0
4/23/2019	6:01:45	838	62.8	52	0
4/23/2019	6:02:45	820	62.6	52.7	0
4/23/2019	6:03:45	813	62.5	53.3	0
4/23/2019	6:04:45	812	62.5	53.6	0
4/23/2019	6:05:45	813	62.6	53.6	0
4/23/2019	6:06:45	816	62.7	53.5	0
4/23/2019	6:07:45	828	62.8	53.6	0
4/23/2019	6:08:45	846	62.9	53.8	0
4/23/2019	6:09:45	861	63	54	0
4/23/2019	6:10:45	878	63	54.2	0
4/23/2019	6:11:45	895	63.1	54.4	0
4/23/2019	6:12:45	911	63.2	54.5	0
4/23/2019	6:13:45	917	63.3	54.6	0

4/23/2019	6:14:45	934	63.3	54.7	0
4/23/2019	6:15:45	947	63.4	54.9	0
4/23/2019	6:16:45	913	63.2	54.5	0
4/23/2019	6:17:45	862	62.9	52.9	0
4/23/2019	6:18:45	828	62.7	52.7	0
4/23/2019	6:19:45	813	62.5	53.5	0
4/23/2019	6:20:45	811	62.5	53.9	0
4/23/2019	6:21:45	812	62.6	53.9	0
4/23/2019	6:22:45	817	62.7	53.9	0
4/23/2019	6:23:45	839	62.8	54.4	0
4/23/2019	6:24:45	886	63	55.4	0
4/23/2019	6:25:45	936	63.2	56	0
4/23/2019	6:26:45	966	63.4	56.6	0
4/23/2019	6:27:45	878	63.7	59.2	0
4/23/2019	6:28:45	809	63.9	60.5	0
4/23/2019	6:29:45	773	64.2	61.2	0
4/23/2019	6:30:45	790	64.3	61.3	0
4/23/2019	6:31:45	811	64.5	61.4	0
4/23/2019	6:32:45	789	64.5	60.9	0
4/23/2019	6:33:45	754	63.9	56.7	0
4/23/2019	6:34:45	734	63	53.9	0
4/23/2019	6:35:45	728	63	54.7	0
4/23/2019	6:36:45	734	63	56.9	0
4/23/2019	6:37:45	744	63.2	59.1	0
4/23/2019	6:38:45	751	63.4	60.2	0
4/23/2019	6:39:45	749	63.7	60.6	0
4/23/2019	6:40:45	744	63.9	61.2	0
4/23/2019	6:41:45	743	64.1	61.4	0
4/23/2019	6:42:45	746	64.2	61.8	0
4/23/2019	6:43:45	750	64.4	61.8	0
4/23/2019	6:44:45	752	64.5	62	0
4/23/2019	6:45:45	754	64.6	62.1	0
4/23/2019	6:46:45	758	64.7	62.2	0
4/23/2019	6:47:45	760	64.7	62.3	0

4/23/2019	6:48:45	761	64.8	62.5	0
4/23/2019	6:49:45	762	64.7	61.9	0
4/23/2019	6:50:45	750	64.2	58.2	0
4/23/2019	6:51:45	743	63.6	56.2	0
4/23/2019	6:52:45	744	63.4	56	0
4/23/2019	6:53:45	743	63.4	56.7	0
4/23/2019	6:54:45	752	63.5	58.7	0
4/23/2019	6:55:45	766	63.6	59.9	0
4/23/2019	6:56:45	766	63.8	60.4	0
4/23/2019	6:57:45	770	64	60.5	0
4/23/2019	6:58:45	775	64.2	60.7	0
4/23/2019	6:59:45	783	64.3	61	0
4/23/2019	7:00:45	794	64.5	61.4	0
4/23/2019	7:01:45	803	64.6	61.6	0
4/23/2019	7:02:45	804	64.7	61.8	0
4/23/2019	7:03:45	808	64.8	61.9	0
4/23/2019	7:04:45	813	64.8	62.1	0
4/23/2019	7:05:45	824	64.9	62.4	0
4/23/2019	7:06:45	828	64.9	62.5	0
4/23/2019	7:07:45	818	64.4	58.8	0
4/23/2019	7:08:45	798	63.5	54.8	0
4/23/2019	7:09:45	790	63.3	54.7	0
4/23/2019	7:10:45	788	63.3	56.6	0
4/23/2019	7:11:45	804	63.4	59.1	0
4/23/2019	7:12:45	820	63.6	60.8	0
4/23/2019	7:13:45	828	63.9	61.5	0
4/23/2019	7:14:45	828	64.1	61.8	0
4/23/2019	7:15:45	822	64.3	61.9	0
4/23/2019	7:16:45	820	64.4	62	0
4/23/2019	7:17:45	817	64.6	62	0
4/23/2019	7:18:45	810	64.7	62	0
4/23/2019	7:19:45	806	64.8	62	0
4/23/2019	7:20:45	803	64.9	62	0
4/23/2019	7:21:45	798	64.9	62	0

4/23/2019	7:22:45	795	65	62	0
4/23/2019	7:23:45	795	65	62	0
4/23/2019	7:24:45	798	64.8	60.5	0
4/23/2019	7:25:45	784	63.9	56.1	0
4/23/2019	7:26:45	778	63.5	54.6	0
4/23/2019	7:27:45	777	63.4	56	0
4/23/2019	7:28:45	779	63.5	59.3	0
4/23/2019	7:29:45	778	63.7	62.9	0
4/23/2019	7:30:45	771	63.9	65.1	0
4/23/2019	7:31:45	768	64.1	66.5	0
4/23/2019	7:32:45	774	64.4	67.6	0
4/23/2019	7:33:45	782	64.5	67.9	0
4/23/2019	7:34:45	788	64.7	68.1	0
4/23/2019	7:35:45	798	64.8	68.3	0
4/23/2019	7:36:45	809	64.9	68.3	0
4/23/2019	7:37:45	822	64.9	68.3	0
4/23/2019	7:38:45	830	65	68.5	0
4/23/2019	7:39:45	839	65.1	68.7	0
4/23/2019	7:40:45	842	65.1	68.7	0
4/23/2019	7:41:45	835	64.6	64.8	0
4/23/2019	7:42:45	829	63.8	59.8	0
4/23/2019	7:43:45	829	63.5	59.2	0
4/23/2019	7:44:45	1348	63.7	63.9	0
4/23/2019	7:45:45	1727	64	77.5	0
4/23/2019	7:46:45	990	64.1	67.1	0
4/23/2019	7:47:45	924	64.3	66.3	0
4/23/2019	7:48:45	946	64.6	66	0
4/23/2019	7:49:45	966	64.7	66.1	0
4/23/2019	7:50:45	967	64.7	65.9	0
4/23/2019	7:51:45	966	64.7	65.8	0
4/23/2019	7:52:45	964	64.7	65.4	0
4/23/2019	7:53:45	953	64.7	64.7	0
4/23/2019	7:54:45	948	64.7	64.3	0
4/23/2019	7:55:45	946	64.7	64.2	0

4/23/2019	7:56:45	945	64.7	64.1	0
4/23/2019	7:57:45	942	64.7	63.8	0
4/23/2019	7:58:45	937	64.7	63.4	0
4/23/2019	7:59:45	933	64.6	62.9	0
4/23/2019	8:00:45	919	64.3	59.8	0
4/23/2019	8:01:45	905	63.6	57.2	0
4/23/2019	8:02:45	896	63.4	58	0
4/23/2019	8:03:45	892	63.3	58.9	0.1
4/23/2019	8:04:45	892	63.3	59.2	0
4/23/2019	8:05:45	890	63.4	59.3	0
4/23/2019	8:06:45	890	63.5	59.3	0
4/23/2019	8:07:45	890	63.5	59.3	0
4/23/2019	8:08:45	891	63.6	59.3	0
4/23/2019	8:09:45	891	63.7	59.2	0
4/23/2019	8:10:45	892	63.8	59.2	0
4/23/2019	8:11:45	894	63.9	59.1	0
4/23/2019	8:12:45	894	63.9	59	0
4/23/2019	8:13:45	895	64	59.1	0
4/23/2019	8:14:45	898	64	59.2	0.1
4/23/2019	8:15:45	897	64	59.3	0.1
4/23/2019	8:16:45	885	63.6	57.8	0
4/23/2019	8:17:45	875	63.1	56.2	0.1
4/23/2019	8:18:45	871	63	57	0.1
4/23/2019	8:19:45	867	62.9	57.8	0
4/23/2019	8:20:45	867	63	58.2	0
4/23/2019	8:21:45	866	63.1	58.4	0
4/23/2019	8:22:45	866	63.2	58.4	0
4/23/2019	8:23:45	867	63.3	58.4	0.1
4/23/2019	8:24:45	865	63.4	58.4	0
4/23/2019	8:25:45	866	63.5	58.3	0
4/23/2019	8:26:45	867	63.6	58.2	0
4/23/2019	8:27:45	866	63.7	58.1	0.1
4/23/2019	8:28:45	865	63.7	58	0
4/23/2019	8:29:45	865	63.8	58	0.1

4/23/2019	8:30:45	865	63.9	58	0
4/23/2019	8:31:45	866	63.9	57.9	0
4/23/2019	8:32:45	865	63.6	56.6	0
4/23/2019	8:33:45	863	63.2	55.8	0
4/23/2019	8:34:45	860	63	55.6	0
4/23/2019	8:35:45	861	62.9	56.1	0
4/23/2019	8:36:45	862	63	56.5	0
4/23/2019	8:37:45	864	63.1	56.6	0
4/23/2019	8:38:45	868	63.2	56.5	0
4/23/2019	8:39:45	868	63.3	56.4	0
4/23/2019	8:40:45	867	63.4	56.3	0
4/23/2019	8:41:45	870	63.5	56.3	0
4/23/2019	8:42:45	869	63.6	56.7	0
4/23/2019	8:43:45	885	63.8	59.8	0
4/23/2019	8:44:45	901	64.1	61.4	0
4/23/2019	8:45:45	960	64.4	62.3	0
4/23/2019	8:46:45	1019	64.6	62.3	0
4/23/2019	8:47:45	941	64.5	59.8	0
4/23/2019	8:48:45	905	63.9	56.1	0.1
4/23/2019	8:49:45	891	63.5	55.6	0
4/23/2019	8:50:45	888	63.5	57.7	0
4/23/2019	8:51:45	913	63.6	59.8	0
4/23/2019	8:52:45	906	63.8	61.4	0
4/23/2019	8:53:45	907	64.2	62.4	0
4/23/2019	8:54:45	925	64.5	62.6	0
4/23/2019	8:55:45	930	64.7	62.9	0
4/23/2019	8:56:45	934	64.8	62.6	0
4/23/2019	8:57:45	887	64.9	62.7	0
4/23/2019	8:58:45	860	65	62.8	0
4/23/2019	8:59:45	870	65.2	63	0
4/23/2019	9:00:45	927	65.3	63.1	0
4/23/2019	9:01:45	943	65.4	63	0
4/23/2019	9:02:45	946	65.4	62.6	0
4/23/2019	9:03:45	911	65.1	60.4	0



4/23/2019	9:04:45	872	64.5	57.5	0
4/23/2019	9:05:45	846	64.2	56.5	0
4/23/2019	9:06:45	840	64	56.9	0
4/23/2019	9:07:45	838	63.9	57.2	0
4/23/2019	9:08:45	836	63.9	57.2	0
4/23/2019	9:09:45	834	63.9	56.8	0
4/23/2019	9:10:45	832	64	56.6	0
4/23/2019	9:11:45	829	64	56.5	0
4/23/2019	9:12:45	830	64.1	56.4	0
4/23/2019	9:13:45	829	64.1	56.4	0
4/23/2019	9:14:45	830	64.2	56.3	0
4/23/2019	9:15:45	830	64.3	56.3	0
4/23/2019	9:16:45	829	64.4	56.1	0
4/23/2019	9:17:45	829	64.5	56	0
4/23/2019	9:18:45	830	64.5	55.9	0
4/23/2019	9:19:45	818	64.4	55.8	0
4/23/2019	9:20:45	793	63.8	54.1	0
4/23/2019	9:21:45	775	63.3	53.6	0
4/23/2019	9:22:45	766	63.2	54.9	0
4/23/2019	9:23:45	764	63.2	55.6	0
4/23/2019	9:24:45	763	63.3	55.8	0
4/23/2019	9:25:45	764	63.4	55.9	0
4/23/2019	9:26:45	762	63.5	55.8	0
4/23/2019	9:27:45	762	63.7	55.8	0
4/23/2019	9:28:45	762	63.8	55.7	0
4/23/2019	9:29:45	761	63.9	55.7	0
4/23/2019	9:30:45	760	64	55.9	0
4/23/2019	9:31:45	758	64	56.2	0
4/23/2019	9:32:45	753	64.1	56.3	0
4/23/2019	9:33:45	752	64.2	56.2	0
4/23/2019	9:34:45	754	64.3	56.1	0
4/23/2019	9:35:45	751	64.3	55.6	0
4/23/2019	9:36:45	742	64.1	54.4	0
4/23/2019	9:37:45	730	63.4	52.8	0

4/23/2019	9:38:45	723	63	53.2	0
4/23/2019	9:39:45	721	63	54.2	0
4/23/2019	9:40:45	721	63	54.7	0
4/23/2019	9:41:45	718	63.2	54.9	0
4/23/2019	9:42:45	718	63.3	54.9	0
4/23/2019	9:43:45	721	63.4	54.9	0
4/23/2019	9:44:45	719	63.6	54.7	0
4/23/2019	9:45:45	719	63.7	54.7	0
4/23/2019	9:46:45	717	63.8	54.7	0
4/23/2019	9:47:45	720	63.9	54.7	0
4/23/2019	9:48:45	718	64.1	54.6	0
4/23/2019	9:49:45	717	64.2	54.5	0
4/23/2019	9:50:45	717	64.3	54.5	0
4/23/2019	9:51:45	715	64.3	54.7	0
4/23/2019	9:52:45	711	64	54.5	0
4/23/2019	9:53:45	706	63.5	53.7	0
4/23/2019	9:54:45	707	63.2	53.5	0
4/23/2019	9:55:45	706	63.1	53.8	0
4/23/2019	9:56:45	706	63.1	54.1	0
4/23/2019	9:57:45	705	63.2	54.3	0
4/23/2019	9:58:45	704	63.3	54.4	0
4/23/2019	9:59:45	705	63.4	54.3	0
4/23/2019	10:00:45	706	63.6	54.1	0
4/23/2019	10:01:45	706	63.7	54	0
4/23/2019	10:02:45	706	63.8	53.9	0
4/23/2019	10:03:45	705	64	53.8	0
4/23/2019	10:04:45	706	64.1	53.7	0
4/23/2019	10:05:45	704	64.2	53.6	0
4/23/2019	10:06:45	704	64.3	53.5	0
4/23/2019	10:07:45	704	64.3	53.5	0
4/23/2019	10:08:45	703	64.4	53.4	0
4/23/2019	10:09:45	703	64.5	53.4	0
4/23/2019	10:10:45	704	64.6	53.3	0
4/23/2019	10:11:45	703	64.7	53.3	0

4/23/2019	10:12:45	703	64.7	53.3	0
4/23/2019	10:13:45	703	64.8	53.3	0
4/23/2019	10:14:45	703	64.8	53.3	0
4/23/2019	10:15:45	702	64.9	53.3	0
4/23/2019	10:16:45	703	64.9	53.3	0
4/23/2019	10:17:45	703	65	53.3	0
4/23/2019	10:18:45	703	65	53.4	0
4/23/2019	10:19:45	703	65.1	53.4	0
4/23/2019	10:20:45	700	65.1	53.5	0
4/23/2019	10:21:45	701	65.1	53.6	0
4/23/2019	10:22:45	701	65.2	53.6	0
4/23/2019	10:23:45	701	65.2	53.6	0
4/23/2019	10:24:45	701	65.2	53.7	0
4/23/2019	10:25:45	701	65.3	53.7	0
4/23/2019	10:26:45	701	65.3	53.8	0
4/23/2019	10:27:45	701	65.4	53.9	0
4/23/2019	10:28:45	702	65.4	53.9	0
4/23/2019	10:29:45	702	65.4	53.9	0
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4/23/2019	10:31:45	701	65.5	54.2	0
4/23/2019	10:32:45	702	65.5	54.2	0
4/23/2019	10:33:45	702	65.6	54.3	0
4/23/2019	10:34:45	704	65.6	54.4	0
4/23/2019	10:35:45	705	65.5	54.9	0
4/23/2019	10:36:45	727	65.3	54.4	0
4/23/2019	10:37:45	748	64.8	53.9	0
4/23/2019	10:38:45	765	64.2	53.6	0
4/23/2019	10:39:45	781	63.8	53.3	0
4/23/2019	10:40:45	798	63.4	53.2	0
4/23/2019	10:41:45	804	63.4	53.5	0
4/23/2019	10:42:45	805	63.4	53.8	0
4/23/2019	10:43:45	804	63.5	54	0
4/23/2019	10:44:45	806	63.7	53.9	0
4/23/2019	10:45:45	802	63.8	53.8	0

4/23/2019	10:46:45	803	64	53.7	0
4/23/2019	10:47:45	803	64.1	53.6	0
4/23/2019	10:48:45	801	64.3	53.4	0
4/23/2019	10:49:45	801	64.4	53.5	0
4/23/2019	10:50:45	812	64.2	53.8	0
4/23/2019	10:51:45	827	63.6	52.7	0
4/23/2019	10:52:45	836	63.1	52.4	0
4/23/2019	10:53:45	839	63	53.5	0
4/23/2019	10:54:45	839	63	54.3	0
4/23/2019	10:55:45	837	63.1	55.4	0
4/23/2019	10:56:45	836	63.2	55.8	0
4/23/2019	10:57:45	838	63.3	55.9	0
4/23/2019	10:58:45	837	63.5	55.7	0
4/23/2019	10:59:45	836	63.6	55.4	0
4/23/2019	11:00:45	832	63.8	55.2	0
4/23/2019	11:01:45	839	64	55.3	0
4/23/2019	11:02:45	838	64.1	55.3	0
4/23/2019	11:03:45	835	64.3	55	0
4/23/2019	11:04:45	836	64.3	55.2	0
4/23/2019	11:05:45	835	64	54.6	0
4/23/2019	11:06:45	834	63.4	53.5	0
4/23/2019	11:07:45	833	62.8	52.4	0
4/23/2019	11:08:45	831	62.7	53.6	0
4/23/2019	11:09:45	831	62.7	54.5	0
4/23/2019	11:10:45	828	62.9	54.8	0
4/23/2019	11:11:45	828	63.1	54.7	0
4/23/2019	11:12:45	827	63.3	54.6	0
4/23/2019	11:13:45	828	63.5	54.4	0
4/23/2019	11:14:45	827	63.7	54.9	0
4/23/2019	11:15:45	825	63.9	55.2	0
4/23/2019	11:16:45	821	64	55.3	0
4/23/2019	11:17:45	820	64.1	55.2	0
4/23/2019	11:18:45	818	64.3	55	0
4/23/2019	11:19:45	813	64.3	54.7	0

4/23/2019	11:20:45	811	64.1	54.1	0
4/23/2019	11:21:45	811	63.7	53.3	0
4/23/2019	11:22:45	817	63.3	52.8	0
4/23/2019	11:23:45	819	63	52.6	0
4/23/2019	11:24:45	819	63	52.9	0
4/23/2019	11:25:45	819	63	53.1	0
4/23/2019	11:26:45	819	63.1	53.2	0
4/23/2019	11:27:45	818	63.3	53.1	0
4/23/2019	11:28:45	815	63.5	53	0
4/23/2019	11:29:45	814	63.7	52.9	0
4/23/2019	11:30:45	813	63.9	52.7	0
4/23/2019	11:31:45	812	64	52.6	0
4/23/2019	11:32:45	808	64.1	53	0
4/23/2019	11:33:45	817	63.8	53	0
4/23/2019	11:34:45	831	63.3	52.1	0
4/23/2019	11:35:45	837	62.9	52.4	0
4/23/2019	11:36:45	837	62.7	52.8	0
4/23/2019	11:37:45	837	62.8	53.2	0
4/23/2019	11:38:45	835	62.9	53.2	0
4/23/2019	11:39:44	833	63.1	53.1	0
4/23/2019	11:40:44	829	63.3	52.9	0
4/23/2019	11:41:44	826	63.4	52.7	0
4/23/2019	11:42:44	825	63.6	52.6	0
4/23/2019	11:43:44	823	63.8	52.7	0
4/23/2019	11:44:44	820	63.9	52.6	0
4/23/2019	11:45:44	811	63.9	52.8	0
4/23/2019	11:46:44	797	63.6	52.7	0
4/23/2019	11:47:44	786	63.2	52.5	0
4/23/2019	11:48:44	774	62.8	52.5	0
4/23/2019	11:49:44	762	62.6	52.6	0
4/23/2019	11:50:44	759	62.6	53	0
4/23/2019	11:51:44	754	62.8	53.1	0
4/23/2019	11:52:44	755	62.9	53	0
4/23/2019	11:53:44	751	63.1	52.8	0

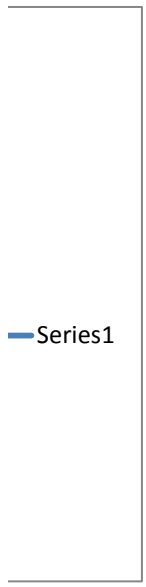
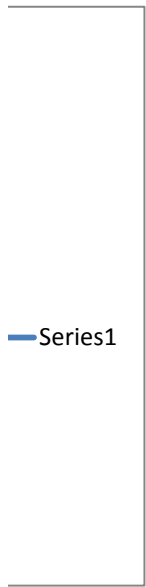
4/23/2019	11:54:44	748	63.3	52.7	0
4/23/2019	11:55:44	745	63.4	52.6	0
4/23/2019	11:56:44	744	63.6	52.6	0
4/23/2019	11:57:44	739	63.8	52.4	0
4/23/2019	11:58:44	736	63.9	52.2	0
4/23/2019	11:59:44	724	63.6	52.2	0
4/23/2019	12:00:44	714	63.2	52.2	0
4/23/2019	12:01:44	705	62.8	52.3	0
4/23/2019	12:02:44	689	62.5	52.5	0
4/23/2019	12:03:44	680	62.5	52.9	0
4/23/2019	12:04:44	677	62.6	53.1	0
4/23/2019	12:05:44	676	62.8	53	0
4/23/2019	12:06:44	675	62.9	52.8	0
4/23/2019	12:07:44	671	63.1	52.6	0
4/23/2019	12:08:44	667	63.3	52.6	0
4/23/2019	12:09:44	665	63.5	52.7	0
4/23/2019	12:10:44	660	63.6	52.6	0
4/23/2019	12:11:44	657	63.8	52.2	0
4/23/2019	12:12:44	646	63.7	52.8	0
4/23/2019	12:13:44	635	63.4	52.9	0
4/23/2019	12:14:44	627	62.9	53	0
4/23/2019	12:15:44	622	62.5	53	0
4/23/2019	12:16:44	617	62.5	53.2	0
4/23/2019	12:17:44	616	62.5	53.4	0
4/23/2019	12:18:44	615	62.7	53.4	0
4/23/2019	12:19:44	615	62.9	53.2	0
4/23/2019	12:20:44	614	63.1	52.8	0
4/23/2019	12:21:44	611	63.3	52.5	0
4/23/2019	12:22:44	609	63.5	52.4	0
4/23/2019	12:23:44	608	63.6	52.4	0
4/23/2019	12:24:44	607	63.8	52.3	0
4/23/2019	12:25:44	603	63.9	52.4	0
4/23/2019	12:26:44	600	63.7	52.9	0
4/23/2019	12:27:44	599	63.4	52.8	0

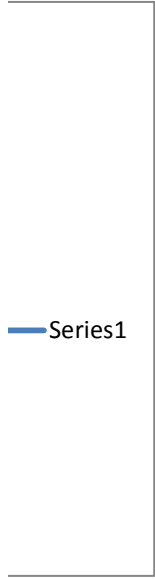
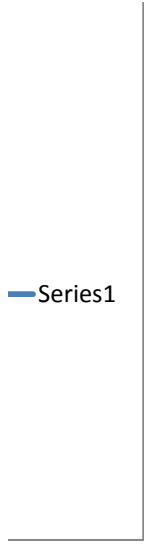


4/23/2019	12:28:44	595	63	52.7	0
4/23/2019	12:29:44	592	62.6	52.7	0
4/23/2019	12:30:44	590	62.5	52.7	0
4/23/2019	12:31:44	590	62.5	53	0
4/23/2019	12:32:44	588	62.6	53.1	0
4/23/2019	12:33:44	587	62.8	52.9	0
4/23/2019	12:34:44	586	63	52.6	0
4/23/2019	12:35:44	585	63.2	52.4	0
4/23/2019	12:36:44	584	63.4	52.3	0
4/23/2019	12:37:44	584	63.6	52.3	0
4/23/2019	12:38:44	583	63.8	52.2	0
4/23/2019	12:39:44	580	63.8	52.4	0
4/23/2019	12:40:44	577	63.7	52.8	0
4/23/2019	12:41:44	580	63.2	52.6	0
4/23/2019	12:42:44	583	62.9	52.6	0
4/23/2019	12:43:44	583	62.5	52.5	0
4/23/2019	12:44:44	582	62.5	52.6	0
4/23/2019	12:45:44	584	62.6	52.8	0
4/23/2019	12:46:44	584	62.7	52.8	0
4/23/2019	12:47:44	584	62.9	52.7	0
4/23/2019	12:48:44	581	63.1	52.5	0
4/23/2019	12:49:44	582	63.4	52.3	0
4/23/2019	12:50:44	581	63.6	52.1	0
4/23/2019	12:51:44	579	63.8	52.1	0
4/23/2019	12:52:44	578	64	52.2	0
4/23/2019	12:53:44	583	64	53.1	0
4/23/2019	12:54:44	597	63.8	53.1	0
4/23/2019	12:55:44	605	63.5	53	0
4/23/2019	12:56:44	613	63.2	53.1	0
4/23/2019	12:57:44	618	62.9	53.2	0
4/23/2019	12:58:44	624	62.8	53.3	0
4/23/2019	12:59:44	625	62.8	53.5	0
4/23/2019	13:00:44	624	63	53.5	0
4/23/2019	13:01:44	625	63.1	53.4	0

4/23/2019	13:02:44	624	63.4	53.2	0
4/23/2019	13:03:44	624	63.6	52.9	0
4/23/2019	13:04:44	622	63.8	52.7	0
4/23/2019	13:05:44	619	64	52.5	0
4/23/2019	13:06:44	616	64.1	52.6	0
4/23/2019	13:07:44	612	64.3	52.8	0
4/23/2019	13:08:44	620	64.2	53.4	0
4/23/2019	13:09:44	637	63.9	53.2	0
4/23/2019	13:10:44	647	63.6	53.2	0
4/23/2019	13:11:44	653	63.4	53.2	0
4/23/2019	13:12:44	659	63.1	53.3	0
4/23/2019	13:13:44	663	62.9	53.4	0
4/23/2019	13:14:44	664	63	53.6	0
4/23/2019	13:15:44	664	63.2	53.6	0
4/23/2019	13:16:44	662	63.4	53.5	0
4/23/2019	13:17:44	661	63.7	53.2	0
4/23/2019	13:18:44	661	63.9	53.1	0
4/23/2019	13:19:44	659	64.2	52.9	0
4/23/2019	13:20:44	654	64.3	52.8	0
4/23/2019	13:21:44	655	64.5	54.1	0
4/23/2019	13:22:44	687	64.5	54.5	0
4/23/2019	13:23:44	700	64	53.7	0
4/23/2019	13:24:44	700	63.5	53.1	0
4/23/2019	13:25:44	700	63	52.9	0
4/23/2019	13:26:44	704	62.7	52.7	0
4/23/2019	13:27:44	701	62.8	52.9	0
4/23/2019	13:28:44	702	63	53	0
4/23/2019	13:29:44	702	63.2	52.9	0
4/23/2019	13:30:44	700	63.4	52.8	0
4/23/2019	13:31:44	697	63.6	52.6	0
4/23/2019	13:32:44	693	63.9	52.4	0
4/23/2019	13:33:44	690	63.7	51.8	0
4/23/2019	13:34:44	695	63.3	51.5	0
4/23/2019	13:35:44	704	63	51.7	0

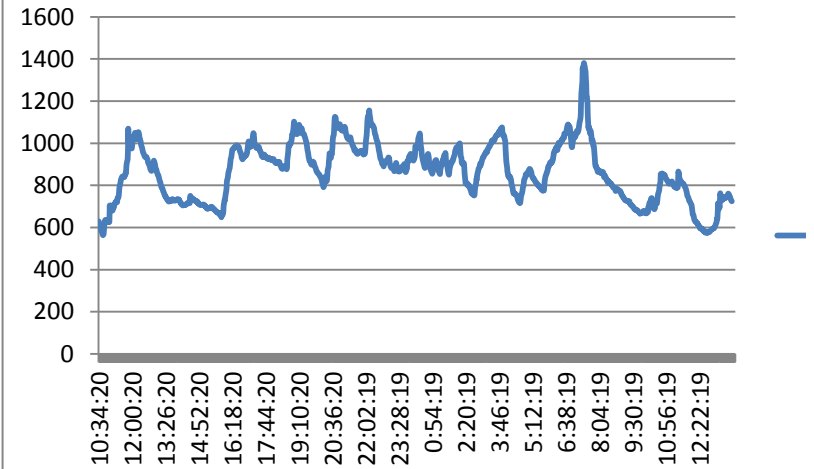
4/23/2019	13:36:44	708	62.7	51.7	0
4/23/2019	13:37:44	713	62.4	51.7	0
4/23/2019	13:38:44	718	62.1	51.8	0
4/23/2019	13:39:44	718	62.3	52	0
4/23/2019	13:40:44	716	62.5	52.1	0
4/23/2019	13:41:44	716	62.8	52	0
4/23/2019	13:42:44	714	63.1	51.9	0
4/23/2019	13:43:44	711	63.4	51.8	0
4/23/2019	13:44:44	709	63.7	51.6	0
4/23/2019	13:45:44	702	63.8	51.4	0
4/23/2019	13:46:44	687	63.5	51.1	0
4/23/2019	13:47:44	687	63.2	51	0
4/23/2019	13:48:44	689	62.8	51	0



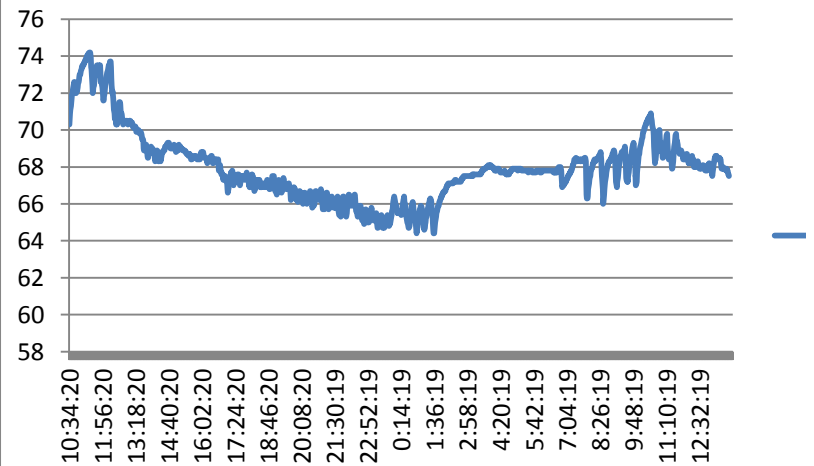


Date	Time	CO2	T	H	CO
Minutes		1632	1632	1632	1632
Minimum		563	64.4	44.7	0
Maximum		1381	74.2	70.3	1.5
Average		865.2175	69.52258	48.35202	0.332661
4/22/2019	10:34:20	628	70.3	57.5	0.2
4/22/2019	10:35:20	610	70.6	56.6	0.1
4/22/2019	10:36:20	595	70.9	56	0
4/22/2019	10:37:20	596	71.1	55.4	0.1
4/22/2019	10:38:20	591	71.3	54.8	0
4/22/2019	10:39:20	587	71.5	54.4	0
4/22/2019	10:40:20	588	71.7	54	0
4/22/2019	10:41:20	584	71.9	53.7	0
4/22/2019	10:42:20	576	72	53.4	0
4/22/2019	10:43:20	573	72.2	53.2	0
4/22/2019	10:44:20	565	72.3	53	0
4/22/2019	10:45:20	563	72.5	52.8	0
4/22/2019	10:46:20	568	72.6	52.4	0
4/22/2019	10:47:20	587	72.6	50.9	0
4/22/2019	10:48:20	609	72.4	49.6	0
4/22/2019	10:49:20	622	72.2	49.1	0
4/22/2019	10:50:20	633	72	48.4	0
4/22/2019	10:51:20	637	72	49.3	0
4/22/2019	10:52:20	632	72.1	49.6	0
4/22/2019	10:53:20	633	72.1	49.7	0
4/22/2019	10:54:20	630	72.2	49.7	0
4/22/2019	10:55:20	628	72.3	49.7	0
4/22/2019	10:56:20	629	72.5	49.6	0
4/22/2019	10:57:20	626	72.6	49.5	0
4/22/2019	10:58:20	625	72.7	49.4	0
4/22/2019	10:59:20	625	72.9	49.4	0
4/22/2019	11:00:20	627	73	49.5	0
4/22/2019	11:01:20	626	73	49.4	0
4/22/2019	11:02:20	705	73.1	50	0

## Carbon Dioxide (CO2)



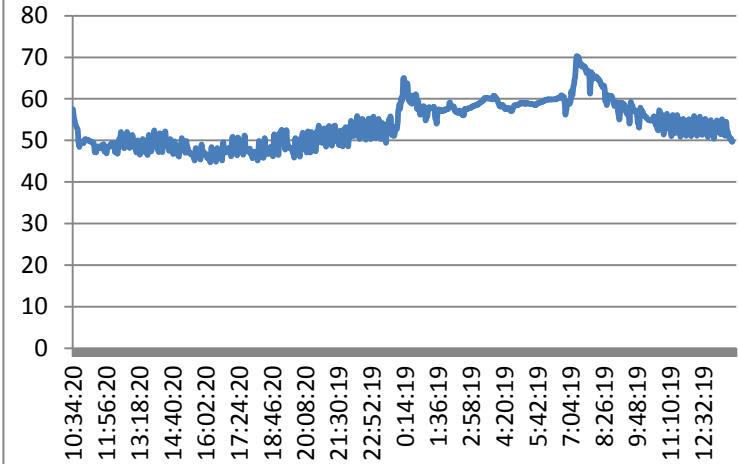
## Temperature (F)



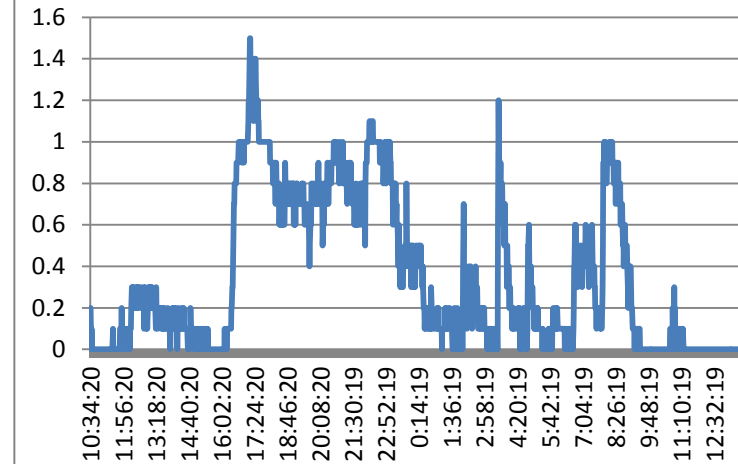


4/22/2019	11:03:20	685	73.2	50.1	0
4/22/2019	11:04:20	684	73.3	50.3	0
4/22/2019	11:05:20	693	73.4	50.3	0
4/22/2019	11:06:20	704	73.4	50.2	0
4/22/2019	11:07:20	702	73.5	50.2	0
4/22/2019	11:08:20	688	73.5	50.1	0
4/22/2019	11:09:20	681	73.5	50.1	0
4/22/2019	11:10:20	699	73.6	50.2	0
4/22/2019	11:11:20	698	73.6	50.1	0
4/22/2019	11:12:20	693	73.7	50.1	0
4/22/2019	11:13:20	697	73.7	50	0
4/22/2019	11:14:20	709	73.8	49.9	0
4/22/2019	11:15:20	715	73.8	49.8	0
4/22/2019	11:16:20	717	73.9	49.8	0
4/22/2019	11:17:20	720	73.9	49.7	0
4/22/2019	11:18:20	719	74	49.7	0
4/22/2019	11:19:20	726	74	49.7	0
4/22/2019	11:20:20	721	74.1	49.7	0
4/22/2019	11:21:20	720	74.1	49.7	0
4/22/2019	11:22:20	734	74.1	49.6	0
4/22/2019	11:23:20	741	74.2	49.5	0
4/22/2019	11:24:20	742	74.2	49.4	0
4/22/2019	11:25:20	749	74.2	49.4	0
4/22/2019	11:26:20	764	74.2	49.2	0
4/22/2019	11:27:20	787	73.9	48.2	0
4/22/2019	11:28:20	803	73.4	47.2	0
4/22/2019	11:29:20	808	73.3	47.3	0
4/22/2019	11:30:20	817	73	47.3	0.1
4/22/2019	11:31:20	826	72.4	47.1	0
4/22/2019	11:32:20	831	72	47.2	0
4/22/2019	11:33:20	839	72.1	48.2	0
4/22/2019	11:34:20	841	72.3	48.4	0
4/22/2019	11:35:20	839	72.4	48.4	0
4/22/2019	11:36:20	838	72.6	48.6	0

### Humidity (%)



### Carbon Monoxide (CO)



4/22/2019	11:37:20	840	72.8	48.5	0
4/22/2019	11:38:20	840	72.9	48.4	0
4/22/2019	11:39:20	839	73.1	48.2	0
4/22/2019	11:40:20	846	73.2	48.3	0
4/22/2019	11:41:20	845	73.4	48.3	0
4/22/2019	11:42:20	852	73.5	48.2	0
4/22/2019	11:43:20	860	73.4	48.1	0
4/22/2019	11:44:20	859	73.3	48.7	0
4/22/2019	11:45:20	888	73.4	48.6	0
4/22/2019	11:46:20	904	73.5	48.8	0
4/22/2019	11:47:20	917	73.5	48.8	0
4/22/2019	11:48:20	923	73.5	49	0.1
4/22/2019	11:49:20	964	73.4	49	0.1
4/22/2019	11:50:20	1070	73.5	49.1	0.1
4/22/2019	11:51:20	1005	73.1	48.1	0.1
4/22/2019	11:52:20	1001	72.6	47.3	0.2
4/22/2019	11:53:20	991	72.7	47.4	0.1
4/22/2019	11:54:20	988	72.5	47.5	0.1
4/22/2019	11:55:20	988	72.4	47.6	0.1
4/22/2019	11:56:20	982	72.3	47.3	0
4/22/2019	11:57:20	981	71.9	46.9	0.1
4/22/2019	11:58:20	976	71.6	47.4	0.1
4/22/2019	11:59:20	975	71.6	48	0.1
4/22/2019	12:00:20	988	71.8	48.4	0
4/22/2019	12:01:20	1016	72	48.5	0.1
4/22/2019	12:02:20	1031	72.2	48.5	0
4/22/2019	12:03:20	1033	72.4	48.4	0.1
4/22/2019	12:04:20	1033	72.5	48.4	0
4/22/2019	12:05:20	1037	72.7	48.5	0.1
4/22/2019	12:06:20	1034	72.9	48.9	0.1
4/22/2019	12:07:20	1049	73	49	0.1
4/22/2019	12:08:20	1037	73.1	49.1	0.1
4/22/2019	12:09:20	1030	73.2	49.2	0
4/22/2019	12:10:20	1025	73.3	49.3	0.1

4/22/2019	12:11:20	1019	73.4	49	0.1
4/22/2019	12:12:20	1021	73.5	48.9	0
4/22/2019	12:13:20	1035	73.5	49	0.1
4/22/2019	12:14:20	1041	73.6	49.1	0.1
4/22/2019	12:15:20	1052	73.7	49.3	0.1
4/22/2019	12:16:20	1053	73.7	49.3	0.2
4/22/2019	12:17:20	1046	73.4	48.1	0.3
4/22/2019	12:18:20	1040	72.8	47.2	0.2
4/22/2019	12:19:20	1027	72.4	47.2	0.2
4/22/2019	12:20:20	1018	72	47.4	0.3
4/22/2019	12:21:20	1012	72.1	47.5	0.2
4/22/2019	12:22:20	1005	71.9	47.3	0.2
4/22/2019	12:23:20	993	71.7	47	0.2
4/22/2019	12:24:20	988	71.1	46.8	0.3
4/22/2019	12:25:20	980	71	47	0.2
4/22/2019	12:26:20	971	70.9	47.9	0.2
4/22/2019	12:27:20	965	70.6	49.3	0.2
4/22/2019	12:28:20	957	70.6	50.3	0.2
4/22/2019	12:29:20	951	70.5	49.5	0.3
4/22/2019	12:30:20	948	70.3	49.1	0.2
4/22/2019	12:31:20	942	70.4	50.2	0.2
4/22/2019	12:32:20	938	70.3	51.5	0.3
4/22/2019	12:33:20	936	70.5	52	0.2
4/22/2019	12:34:20	935	70.7	51.6	0.2
4/22/2019	12:35:20	933	70.9	51.4	0.2
4/22/2019	12:36:20	934	71.1	51.1	0.3
4/22/2019	12:37:20	934	71.3	50.8	0.3
4/22/2019	12:38:20	930	71.5	50.6	0.3
4/22/2019	12:39:20	923	71.5	49.4	0.3
4/22/2019	12:40:20	916	71.4	48.2	0.3
4/22/2019	12:41:20	909	71.1	48.1	0.2
4/22/2019	12:42:20	905	70.9	49.7	0.2
4/22/2019	12:43:20	901	70.9	51.1	0.2
4/22/2019	12:44:20	895	70.8	50.6	0.2

4/22/2019	12:45:20	891	70.6	49.6	0.2
4/22/2019	12:46:20	885	70.5	49.6	0.2
4/22/2019	12:47:20	877	70.3	51.2	0.3
4/22/2019	12:48:20	874	70.4	52	0.1
4/22/2019	12:49:20	869	70.4	51.2	0.2
4/22/2019	12:50:20	868	70.4	50.3	0.3
4/22/2019	12:51:20	885	70.4	49.9	0.2
4/22/2019	12:52:20	902	70.4	49.5	0.2
4/22/2019	12:53:20	899	70.5	48.6	0.1
4/22/2019	12:54:20	897	70.4	48.2	0.2
4/22/2019	12:55:20	904	70.4	49.8	0.2
4/22/2019	12:56:20	918	70.5	51	0.1
4/22/2019	12:57:20	913	70.5	50.5	0.2
4/22/2019	12:58:20	902	70.4	49.5	0.3
4/22/2019	12:59:20	894	70.3	49.6	0.3
4/22/2019	13:00:20	884	70.4	51	0.3
4/22/2019	13:01:20	875	70.4	51.3	0.2
4/22/2019	13:02:20	873	70.4	51	0.3
4/22/2019	13:03:20	866	70.5	50.1	0.3
4/22/2019	13:04:20	860	70.5	49.5	0.2
4/22/2019	13:05:20	857	70.5	48.8	0.3
4/22/2019	13:06:20	851	70.4	48.4	0.2
4/22/2019	13:07:20	848	70.4	48.4	0.2
4/22/2019	13:08:20	842	70.4	48.2	0.3
4/22/2019	13:09:20	835	70.4	47.9	0.2
4/22/2019	13:10:20	830	70.3	47.5	0.2
4/22/2019	13:11:20	821	70.2	47.1	0.2
4/22/2019	13:12:20	815	70.2	47.5	0.2
4/22/2019	13:13:20	806	70.1	49.2	0.2
4/22/2019	13:14:20	802	70.1	50	0.2
4/22/2019	13:15:20	795	70.2	49.2	0.2
4/22/2019	13:16:20	790	70.2	48.9	0.2
4/22/2019	13:17:20	788	70.2	48.1	0.1
4/22/2019	13:18:20	783	70.1	47.7	0.3

4/22/2019	13:19:20	779	70.1	47.2	0.2
4/22/2019	13:20:20	772	69.9	46.6	0.2
4/22/2019	13:21:20	767	69.9	47.2	0.2
4/22/2019	13:22:20	761	69.9	48.9	0.1
4/22/2019	13:23:20	756	69.9	49.5	0.2
4/22/2019	13:24:20	755	69.9	48.5	0.2
4/22/2019	13:25:20	749	70	47.9	0.2
4/22/2019	13:26:20	747	69.9	49	0.2
4/22/2019	13:27:20	742	69.9	50.3	0.2
4/22/2019	13:28:20	739	69.8	49.8	0.2
4/22/2019	13:29:20	737	69.9	49.3	0.2
4/22/2019	13:30:20	734	69.9	48.9	0.1
4/22/2019	13:31:20	734	69.9	48.1	0.2
4/22/2019	13:32:20	730	69.8	47.8	0.2
4/22/2019	13:33:20	725	69.7	47.2	0.2
4/22/2019	13:34:20	725	69.5	47.1	0.1
4/22/2019	13:35:20	723	69.5	47.3	0.2
4/22/2019	13:36:20	727	69.5	47.1	0.1
4/22/2019	13:37:20	729	69.4	47.2	0.1
4/22/2019	13:38:20	731	69	46.7	0.1
4/22/2019	13:39:20	729	68.9	46.5	0.2
4/22/2019	13:40:20	726	68.9	48.7	0.1
4/22/2019	13:41:20	726	69	50.6	0.1
4/22/2019	13:42:20	732	69.2	51.3	0.1
4/22/2019	13:43:20	733	69.2	49.7	0.1
4/22/2019	13:44:20	735	69.2	49.1	0.1
4/22/2019	13:45:20	731	69.1	48.5	0.1
4/22/2019	13:46:20	731	69.1	48.1	0.1
4/22/2019	13:47:20	729	68.6	47.3	0.2
4/22/2019	13:48:20	728	68.5	47.4	0.1
4/22/2019	13:49:20	728	68.5	49.6	0.1
4/22/2019	13:50:20	727	68.8	51.1	0.1
4/22/2019	13:51:20	727	68.9	50.8	0.1
4/22/2019	13:52:20	729	68.8	48.9	0.1

4/22/2019	13:53:20	731	68.7	49.4	0
4/22/2019	13:54:20	732	68.8	51.3	0.1
4/22/2019	13:55:20	732	69	52.4	0.1
4/22/2019	13:56:20	734	69.1	50.8	0.1
4/22/2019	13:57:20	734	69	49.8	0.1
4/22/2019	13:58:20	735	68.9	49.1	0.2
4/22/2019	13:59:20	734	69	48.9	0.1
4/22/2019	14:00:20	732	69	48.3	0.1
4/22/2019	14:01:20	729	68.9	48.2	0.1
4/22/2019	14:02:20	729	68.9	48.2	0.1
4/22/2019	14:03:20	723	68.9	48.2	0.2
4/22/2019	14:04:20	719	68.9	48.2	0.1
4/22/2019	14:05:20	715	68.6	47.7	0.2
4/22/2019	14:06:20	715	68.3	47.2	0.2
4/22/2019	14:07:20	711	68.4	48.6	0.1
4/22/2019	14:08:20	709	68.6	50.6	0.1
4/22/2019	14:09:20	706	68.8	51.7	0.1
4/22/2019	14:10:20	704	68.8	50.4	0.1
4/22/2019	14:11:20	705	68.9	49.3	0
4/22/2019	14:12:20	706	68.8	48.9	0.1
4/22/2019	14:13:20	707	68.8	48.3	0.2
4/22/2019	14:14:20	706	68.7	47.7	0.1
4/22/2019	14:15:20	707	68.3	47.2	0.1
4/22/2019	14:16:20	706	68.3	48.3	0.1
4/22/2019	14:17:20	706	68.5	50.5	0.1
4/22/2019	14:18:20	707	68.6	51.6	0.1
4/22/2019	14:19:20	710	68.5	49.7	0.1
4/22/2019	14:20:20	712	68.3	48.7	0.1
4/22/2019	14:21:20	713	68.5	50.7	0.2
4/22/2019	14:22:20	714	68.6	52.2	0.1
4/22/2019	14:23:20	717	68.7	52	0.1
4/22/2019	14:24:20	718	68.8	50.3	0.1
4/22/2019	14:25:20	716	68.8	49.7	0.1
4/22/2019	14:26:20	716	68.8	49.3	0.1



4/22/2019	14:27:20	716	68.9	49	0.2
4/22/2019	14:28:20	716	68.9	48.7	0.1
4/22/2019	14:29:20	743	68.9	48.6	0.1
4/22/2019	14:30:20	750	69	48.6	0.1
4/22/2019	14:31:20	747	69.1	48	0.1
4/22/2019	14:32:20	742	69.1	47.5	0.1
4/22/2019	14:33:20	736	69.1	48.2	0.1
4/22/2019	14:34:20	734	69.1	49.8	0.1
4/22/2019	14:35:20	736	69.2	50.3	0.1
4/22/2019	14:36:20	735	69.2	49.8	0.1
4/22/2019	14:37:20	735	69.3	49.3	0
4/22/2019	14:38:20	732	69.3	48.6	0.1
4/22/2019	14:39:20	732	69.3	48.1	0
4/22/2019	14:40:20	732	69.3	47.7	0.1
4/22/2019	14:41:20	729	69.2	47.2	0
4/22/2019	14:42:20	727	69.1	46.7	0.1
4/22/2019	14:43:20	725	69.1	47.1	0.1
4/22/2019	14:44:20	724	69	48.7	0.2
4/22/2019	14:45:20	726	69	49.8	0.1
4/22/2019	14:46:20	725	69	49.3	0.1
4/22/2019	14:47:20	722	69	48.6	0.1
4/22/2019	14:48:20	723	69	48.4	0.1
4/22/2019	14:49:20	717	69	48.2	0.1
4/22/2019	14:50:20	718	69	47.9	0.1
4/22/2019	14:51:20	712	69.1	47.7	0.1
4/22/2019	14:52:20	711	69.1	47.5	0.1
4/22/2019	14:53:20	709	69.2	47.4	0
4/22/2019	14:54:20	707	69.1	46.8	0.1
4/22/2019	14:55:20	708	69	46.3	0.1
4/22/2019	14:56:20	707	69	46.1	0.1
4/22/2019	14:57:20	707	68.9	47	0
4/22/2019	14:58:20	707	68.8	48.8	0
4/22/2019	14:59:20	706	68.9	48.9	0.1
4/22/2019	15:00:20	707	68.9	47.9	0

4/22/2019	15:01:20	708	69	47.9	0
4/22/2019	15:02:20	707	68.9	49.2	0.1
4/22/2019	15:03:20	709	68.9	50.6	0
4/22/2019	15:04:20	709	69.1	50.2	0.1
4/22/2019	15:05:20	708	69.2	49.4	0
4/22/2019	15:06:20	706	69.1	48.5	0.1
4/22/2019	15:07:20	702	69.1	48.5	0
4/22/2019	15:08:20	701	69.1	48	0
4/22/2019	15:09:20	700	69.1	47.8	0
4/22/2019	15:10:20	695	69	47.9	0.1
4/22/2019	15:11:20	693	69	47.4	0.1
4/22/2019	15:12:20	691	69	47	0
4/22/2019	15:13:20	689	69	48.2	0
4/22/2019	15:14:20	691	68.9	49.9	0.1
4/22/2019	15:15:20	689	68.9	49.3	0
4/22/2019	15:16:20	692	68.9	48.6	0.1
4/22/2019	15:17:20	692	68.9	48.5	0
4/22/2019	15:18:20	691	68.9	48	0.1
4/22/2019	15:19:20	694	68.9	47.7	0
4/22/2019	15:20:20	694	68.9	47.4	0
4/22/2019	15:21:20	695	68.8	47	0
4/22/2019	15:22:20	697	68.8	47.1	0.1
4/22/2019	15:23:20	697	68.8	46.9	0.1
4/22/2019	15:24:20	698	68.7	46.8	0
4/22/2019	15:25:20	696	68.7	46.9	0
4/22/2019	15:26:20	695	68.7	46.9	0
4/22/2019	15:27:20	694	68.7	46.9	0.1
4/22/2019	15:28:20	692	68.7	46.6	0
4/22/2019	15:29:20	688	68.6	46.6	0
4/22/2019	15:30:20	687	68.7	46.6	0
4/22/2019	15:31:20	686	68.6	46.3	0
4/22/2019	15:32:20	685	68.7	46.2	0
4/22/2019	15:33:20	682	68.6	45.8	0
4/22/2019	15:34:20	682	68.6	45.6	0

4/22/2019	15:35:20	679	68.4	45.2	0
4/22/2019	15:36:20	677	68.4	46.3	0
4/22/2019	15:37:20	674	68.4	47.9	0
4/22/2019	15:38:20	674	68.5	48.2	0
4/22/2019	15:39:20	673	68.5	47.3	0
4/22/2019	15:40:20	670	68.5	46.9	0
4/22/2019	15:41:20	670	68.5	46.8	0
4/22/2019	15:42:20	668	68.6	46.7	0
4/22/2019	15:43:20	668	68.5	46.4	0
4/22/2019	15:44:20	667	68.5	46.3	0
4/22/2019	15:45:20	664	68.5	46.2	0
4/22/2019	15:46:20	661	68.5	46.1	0
4/22/2019	15:47:20	658	68.6	46.2	0
4/22/2019	15:48:20	656	68.5	45.8	0
4/22/2019	15:49:20	655	68.5	45.4	0
4/22/2019	15:50:20	649	68.4	45.7	0
4/22/2019	15:51:20	667	68.4	47.6	0
4/22/2019	15:52:20	671	68.5	49	0
4/22/2019	15:53:20	661	68.5	47.7	0
4/22/2019	15:54:20	670	68.4	46.8	0
4/22/2019	15:55:20	673	68.4	47.1	0
4/22/2019	15:56:20	703	68.4	47.2	0
4/22/2019	15:57:20	721	68.4	47.3	0
4/22/2019	15:58:20	731	68.5	47.2	0
4/22/2019	15:59:20	729	68.7	47	0
4/22/2019	16:00:20	742	68.8	46.8	0
4/22/2019	16:01:20	764	68.8	46.6	0
4/22/2019	16:02:20	771	68.7	46.5	0
4/22/2019	16:03:20	784	68.7	46.7	0
4/22/2019	16:04:20	815	68.8	46.7	0
4/22/2019	16:05:20	826	68.8	46.2	0
4/22/2019	16:06:20	836	68.7	45.8	0
4/22/2019	16:07:20	850	68.6	45.8	0
4/22/2019	16:08:20	861	68.5	45.8	0

4/22/2019	16:09:20	866	68.5	45.9	0.1
4/22/2019	16:10:20	874	68.5	45.7	0
4/22/2019	16:11:20	883	68.5	45.5	0
4/22/2019	16:12:20	896	68.5	45.4	0
4/22/2019	16:13:20	910	68.4	45	0.1
4/22/2019	16:14:20	925	68.4	44.7	0
4/22/2019	16:15:20	934	68.2	46.1	0.1
4/22/2019	16:16:20	946	68.3	47.6	0.1
4/22/2019	16:17:20	958	68.3	48.4	0.1
4/22/2019	16:18:20	969	68.4	47.5	0.1
4/22/2019	16:19:20	972	68.4	47.1	0.1
4/22/2019	16:20:20	974	68.4	47	0.1
4/22/2019	16:21:20	975	68.5	46.9	0.1
4/22/2019	16:22:20	978	68.4	46.6	0.1
4/22/2019	16:23:20	980	68.5	46.6	0.1
4/22/2019	16:24:20	981	68.5	46.4	0.1
4/22/2019	16:25:20	980	68.6	46.3	0.1
4/22/2019	16:26:20	984	68.6	45.9	0.2
4/22/2019	16:27:20	984	68.4	45.3	0.2
4/22/2019	16:28:20	986	68.3	44.9	0.3
4/22/2019	16:29:20	990	68.2	46	0.3
4/22/2019	16:30:20	987	68.2	47.6	0.4
4/22/2019	16:31:20	987	68.3	48.2	0.5
4/22/2019	16:32:20	989	68.4	47.2	0.7
4/22/2019	16:33:20	986	68.4	46.7	0.7
4/22/2019	16:34:20	983	68.4	46.7	0.8
4/22/2019	16:35:20	979	68.4	46.5	0.8
4/22/2019	16:36:20	972	68.3	46.3	0.8
4/22/2019	16:37:20	967	68.4	46.3	0.8
4/22/2019	16:38:20	962	68.3	46.1	0.8
4/22/2019	16:39:20	955	68.3	46	0.9
4/22/2019	16:40:20	951	68.3	46.1	0.9
4/22/2019	16:41:20	946	68.4	45.8	0.9
4/22/2019	16:42:20	936	68.4	45.6	0.9

4/22/2019	16:43:20	929	68.1	45.2	0.9
4/22/2019	16:44:20	924	67.8	47.1	1
4/22/2019	16:45:20	926	68	49.4	1
4/22/2019	16:46:20	933	68.1	49.6	1
4/22/2019	16:47:20	933	68.1	48.3	1
4/22/2019	16:48:20	934	67.9	47.8	1
4/22/2019	16:49:20	935	67.7	47.5	1
4/22/2019	16:50:20	940	67.6	47.4	1
4/22/2019	16:51:20	938	67.7	47.2	1
4/22/2019	16:52:20	942	67.6	47.1	0.9
4/22/2019	16:53:20	941	67.6	47.1	1
4/22/2019	16:54:20	945	67.4	47.2	1
4/22/2019	16:55:20	949	67.3	47.6	1
4/22/2019	16:56:20	952	67.4	47.8	1
4/22/2019	16:57:20	964	67.5	47.9	0.9
4/22/2019	16:58:20	988	67.4	47.8	1
4/22/2019	16:59:20	998	67.5	48.2	1
4/22/2019	17:00:20	1009	67.5	47.8	1
4/22/2019	17:01:20	988	67.4	47.3	1
4/22/2019	17:02:20	986	67.3	47.1	1
4/22/2019	17:03:20	986	67.2	46.9	1
4/22/2019	17:04:20	983	67.1	46.8	1
4/22/2019	17:05:20	986	66.8	46.2	1
4/22/2019	17:06:20	985	66.6	46.6	1
4/22/2019	17:07:20	985	66.7	49	1
4/22/2019	17:08:20	987	66.9	50.8	1.1
4/22/2019	17:09:20	991	67.1	50.9	1.2
4/22/2019	17:10:20	1001	67.2	49.6	1.2
4/22/2019	17:11:20	1029	67.3	49.5	1.3
4/22/2019	17:12:20	1048	67.5	49.5	1.5
4/22/2019	17:13:20	1045	67.6	49.1	1.5
4/22/2019	17:14:20	1024	67.7	48.4	1.3
4/22/2019	17:15:20	1008	67.7	48.1	1.3
4/22/2019	17:16:20	998	67.7	47.9	1.3

4/22/2019	17:17:20	992	67.8	47.7	1.3
4/22/2019	17:18:20	986	67.7	47.2	1.3
4/22/2019	17:19:20	982	67.4	46.6	1.3
4/22/2019	17:20:20	978	67	46.4	1.3
4/22/2019	17:21:20	976	67.2	48.6	1.1
4/22/2019	17:22:20	977	67.3	50.7	1.3
4/22/2019	17:23:20	978	67.3	50.6	1.3
4/22/2019	17:24:20	981	67.2	48.6	1.4
4/22/2019	17:25:20	978	67.4	48.9	1.2
4/22/2019	17:26:20	982	67.5	48.4	1.4
4/22/2019	17:27:20	976	67.5	48.1	1.3
4/22/2019	17:28:20	968	67.5	47.8	1.2
4/22/2019	17:29:20	967	67.5	47.7	1.2
4/22/2019	17:30:20	961	67.6	47.6	1.1
4/22/2019	17:31:20	959	67.6	47.4	1.1
4/22/2019	17:32:20	953	67.6	47.2	1.2
4/22/2019	17:33:20	946	67.6	47.2	1.1
4/22/2019	17:34:20	940	67.5	47.2	1.1
4/22/2019	17:35:20	935	67.2	46.6	1
4/22/2019	17:36:20	935	67	46.9	1
4/22/2019	17:37:20	934	67.1	49.4	1
4/22/2019	17:38:20	938	67.3	51.2	1
4/22/2019	17:39:20	941	67.5	51.1	1
4/22/2019	17:40:20	946	67.5	49.3	1
4/22/2019	17:41:20	939	67.5	48.5	1
4/22/2019	17:42:20	936	67.4	48.1	1
4/22/2019	17:43:20	937	67.4	47.9	1
4/22/2019	17:44:20	937	67.5	47.7	1
4/22/2019	17:45:20	934	67.4	47.5	1
4/22/2019	17:46:20	934	67.5	47.3	1
4/22/2019	17:47:20	928	67.4	47.4	1
4/22/2019	17:48:20	927	67.3	47.3	1
4/22/2019	17:49:20	926	67.4	47.5	1
4/22/2019	17:50:20	930	67.4	47.6	1



4/22/2019	17:51:20	926	67.4	47.7	1
4/22/2019	17:52:20	931	67.6	48	1
4/22/2019	17:53:20	931	67.7	47.5	1
4/22/2019	17:54:20	928	67.5	46.7	1
4/22/2019	17:55:20	925	67.4	46.7	1
4/22/2019	17:56:20	922	67.4	46.5	1
4/22/2019	17:57:20	925	67.3	46.3	1
4/22/2019	17:58:20	925	67	45.7	1
4/22/2019	17:59:20	923	67.1	46	1
4/22/2019	18:00:20	921	66.9	46.5	1
4/22/2019	18:01:20	920	66.9	46.7	1
4/22/2019	18:02:20	921	67.1	47.1	1
4/22/2019	18:03:20	923	67.2	47.2	0.9
4/22/2019	18:04:20	925	67.4	47.3	0.9
4/22/2019	18:05:20	919	67.6	47.2	0.9
4/22/2019	18:06:20	918	67.6	47.1	0.9
4/22/2019	18:07:20	913	67.5	46.5	0.9
4/22/2019	18:08:20	910	67.5	46.3	0.9
4/22/2019	18:09:20	907	67.4	46	0.9
4/22/2019	18:10:20	909	67.3	45.8	0.8
4/22/2019	18:11:20	908	66.9	45.2	0.9
4/22/2019	18:12:20	907	66.7	45.6	0.9
4/22/2019	18:13:20	909	66.8	48	0.9
4/22/2019	18:14:20	907	67	49.9	0.9
4/22/2019	18:15:20	911	66.9	49.1	0.9
4/22/2019	18:16:20	909	67	47.9	0.7
4/22/2019	18:17:20	910	67.1	48	0.9
4/22/2019	18:18:20	911	67.3	48.1	0.9
4/22/2019	18:19:20	911	67.3	47.6	0.8
4/22/2019	18:20:20	903	67.3	47.3	0.8
4/22/2019	18:21:20	897	67.3	47.1	0.8
4/22/2019	18:22:20	893	67.3	47	0.8
4/22/2019	18:23:20	890	67.3	46.9	0.7
4/22/2019	18:24:20	886	67.3	46.7	0.8

4/22/2019	18:25:20	881	67.1	45.8	0.8
4/22/2019	18:26:20	879	66.9	46.3	0.6
4/22/2019	18:27:20	878	66.9	48.9	0.7
4/22/2019	18:28:20	883	67	50.6	0.6
4/22/2019	18:29:20	887	66.9	49.4	0.7
4/22/2019	18:30:20	886	66.9	48.2	0.7
4/22/2019	18:31:20	891	67.1	48.1	0.6
4/22/2019	18:32:20	891	67	47.5	0.7
4/22/2019	18:33:20	888	67	47.4	0.7
4/22/2019	18:34:20	885	67	47.2	0.7
4/22/2019	18:35:20	886	67	47	0.6
4/22/2019	18:36:20	885	67.1	46.9	0.7
4/22/2019	18:37:20	880	67	46.7	0.6
4/22/2019	18:38:20	876	66.9	46.8	0.6
4/22/2019	18:39:20	883	67	47.3	0.6
4/22/2019	18:40:20	924	67	48	0.9
4/22/2019	18:41:20	948	66.9	47.6	0.8
4/22/2019	18:42:20	964	67.1	48.1	0.8
4/22/2019	18:43:20	989	67.3	48.5	0.7
4/22/2019	18:44:20	997	67.3	47.9	0.7
4/22/2019	18:45:20	988	67.2	47.4	0.7
4/22/2019	18:46:20	992	67.2	47.3	0.8
4/22/2019	18:47:20	999	67.1	47.1	0.7
4/22/2019	18:48:20	1001	67	46.7	0.8
4/22/2019	18:49:20	999	66.8	46.2	0.8
4/22/2019	18:50:20	1004	66.8	48.6	0.8
4/22/2019	18:51:20	1023	66.9	50.8	0.8
4/22/2019	18:52:20	1041	67.1	51.5	0.7
4/22/2019	18:53:20	1039	67.1	49.6	0.8
4/22/2019	18:54:20	1048	67.1	49.5	0.7
4/22/2019	18:55:20	1066	67.2	49.5	0.7
4/22/2019	18:56:20	1085	67.5	49.6	0.8
4/22/2019	18:57:20	1103	67.5	49.1	0.7
4/22/2019	18:58:20	1094	67.5	48.6	0.8

4/22/2019	18:59:20	1087	67.5	48.1	0.7
4/22/2019	19:00:20	1087	67.5	48	0.8
4/22/2019	19:01:20	1066	67.2	47.3	0.8
4/22/2019	19:02:20	1052	66.8	46.5	0.6
4/22/2019	19:03:20	1044	66.7	47.5	0.8
4/22/2019	19:04:20	1044	66.7	49.9	0.6
4/22/2019	19:05:20	1044	66.8	51.7	0.7
4/22/2019	19:06:20	1046	66.6	49.7	0.6
4/22/2019	19:07:20	1051	66.5	49.1	0.7
4/22/2019	19:08:20	1062	66.7	51	0.8
4/22/2019	19:09:20	1071	66.9	52.3	0.7
4/22/2019	19:10:20	1087	67.1	52.6	0.8
4/22/2019	19:11:20	1082	67.2	51.4	0.7
4/22/2019	19:12:20	1073	67.3	50.4	0.7
4/22/2019	19:13:20	1065	67.2	49.8	0.7
4/22/2019	19:14:20	1053	67.1	49.4	0.7
4/22/2019	19:15:20	1050	67.1	49.5	0.7
4/22/2019	19:16:20	1071	67.2	49.5	0.7
4/22/2019	19:17:20	1071	67.2	49	0.7
4/22/2019	19:18:20	1054	67	48.5	0.7
4/22/2019	19:19:20	1046	66.6	47.8	0.7
4/22/2019	19:20:20	1045	66.7	49.6	0.7
4/22/2019	19:21:20	1047	66.9	51.5	0.7
4/22/2019	19:22:20	1045	67.1	52.5	0.8
4/22/2019	19:23:20	1044	67.3	51.3	0.7
4/22/2019	19:24:20	1033	67.4	49.7	0.8
4/22/2019	19:25:20	1028	67.2	49.1	0.8
4/22/2019	19:26:20	1023	67.1	48.8	0.8
4/22/2019	19:27:20	1017	67	48.5	0.7
4/22/2019	19:28:20	1007	67	48.4	0.7
4/22/2019	19:29:20	1000	67	48.2	0.6
4/22/2019	19:30:20	991	66.9	48.1	0.6
4/22/2019	19:31:20	980	66.8	48.1	0.7
4/22/2019	19:32:20	967	66.8	48.2	0.7

4/22/2019	19:33:20	954	66.8	48.2	0.7
4/22/2019	19:34:20	940	66.9	48.2	0.7
4/22/2019	19:35:20	933	67	48	0.6
4/22/2019	19:36:20	926	67.1	48	0.6
4/22/2019	19:37:20	917	67.1	47.4	0.6
4/22/2019	19:38:20	914	66.9	47	0.6
4/22/2019	19:39:20	914	66.8	46.9	0.6
4/22/2019	19:40:20	909	66.8	46.9	0.5
4/22/2019	19:41:20	902	66.5	45.9	0.4
4/22/2019	19:42:20	898	66.2	46.5	0.5
4/22/2019	19:43:20	900	66.4	48.8	0.6
4/22/2019	19:44:20	901	66.5	50.6	0.7
4/22/2019	19:45:20	907	66.4	49.1	0.6
4/22/2019	19:46:20	913	66.4	48	0.8
4/22/2019	19:47:20	910	66.7	48.3	0.8
4/22/2019	19:48:20	907	66.8	48.2	0.7
4/22/2019	19:49:20	899	66.9	47.9	0.7
4/22/2019	19:50:20	894	66.9	47.6	0.7
4/22/2019	19:51:20	889	66.8	47.3	0.8
4/22/2019	19:52:20	884	66.8	47.2	0.8
4/22/2019	19:53:20	879	66.7	47.2	0.7
4/22/2019	19:54:20	874	66.5	46.6	0.7
4/22/2019	19:55:20	869	66.2	46.1	0.7
4/22/2019	19:56:20	864	66.2	48.2	0.7
4/22/2019	19:57:20	862	66.3	50.3	0.7
4/22/2019	19:58:20	859	66.3	50.5	0.8
4/22/2019	19:59:20	858	66.1	48	0.7
4/22/2019	20:00:20	855	66.2	49.1	0.8
4/22/2019	20:01:20	851	66.3	51.2	0.7
4/22/2019	20:02:20	850	66.5	51.9	0.8
4/22/2019	20:03:20	849	66.7	50.3	0.9
4/22/2019	20:04:20	845	66.7	48.9	0.8
4/22/2019	20:05:20	841	66.6	48.7	0.7
4/22/2019	20:06:20	838	66.6	48.4	0.8

4/22/2019	20:07:20	833	66.6	48.2	0.7
4/22/2019	20:08:20	827	66.6	48.1	0.7
4/22/2019	20:09:20	821	66.5	47.9	0.8
4/22/2019	20:10:20	813	66.4	47.9	0.7
4/22/2019	20:11:20	803	66.3	47.8	0.7
4/22/2019	20:12:20	797	66	47.1	0.7
4/22/2019	20:13:20	791	66.2	48.4	0.7
4/22/2019	20:14:20	793	66.2	50.9	0.5
4/22/2019	20:15:20	815	66.4	52.2	0.6
4/22/2019	20:16:20	823	66.6	50.8	0.8
4/22/2019	20:17:20	835	66.6	49.7	0.6
4/22/2019	20:18:20	842	66.5	49	0.7
4/22/2019	20:19:20	821	66.5	48.6	0.8
4/22/2019	20:20:20	819	66.3	47.8	0.7
4/22/2019	20:21:20	820	66	47.1	0.7
4/22/2019	20:22:20	825	66.1	48.6	0.8
4/22/2019	20:23:20	846	66.1	51	0.7
4/22/2019	20:24:20	872	66.1	52	0.8
4/22/2019	20:25:20	882	66.1	50.1	0.8
4/22/2019	20:26:20	889	66.2	49.7	0.9
4/22/2019	20:27:20	914	66.4	49.9	0.9
4/22/2019	20:28:20	929	66.5	50.1	0.7
4/22/2019	20:29:20	953	66.7	50	0.8
4/22/2019	20:30:20	951	66.7	49.4	0.8
4/22/2019	20:31:20	932	66.6	48.7	0.8
4/22/2019	20:32:20	929	66.5	48.4	0.8
4/22/2019	20:33:20	940	66.4	48.1	0.8
4/22/2019	20:34:20	949	66.1	47.4	0.9
4/22/2019	20:35:20	963	65.8	47.7	0.8
4/22/2019	20:36:20	980	65.9	50.3	0.9
4/22/2019	20:37:20	1014	66	52.2	0.9
4/22/2019	20:38:19	1032	65.9	51	0.9
4/22/2019	20:39:19	1038	65.9	49.5	0.9
4/22/2019	20:40:20	1056	66	51.2	0.9

4/22/2019	20:41:20	1091	66.2	53	0.9
4/22/2019	20:42:19	1120	66.5	53.6	1
4/22/2019	20:43:19	1125	66.7	52.2	1
4/22/2019	20:44:19	1122	66.7	51	0.9
4/22/2019	20:45:19	1105	66.6	50.3	1
4/22/2019	20:46:19	1088	66.5	50	1
4/22/2019	20:47:19	1087	66.4	49.7	1
4/22/2019	20:48:19	1080	66.4	49.6	1
4/22/2019	20:49:19	1073	66.4	49.6	0.9
4/22/2019	20:50:19	1077	66.3	49.8	0.9
4/22/2019	20:51:19	1087	66.3	49.4	0.9
4/22/2019	20:52:19	1081	66.2	49.4	0.9
4/22/2019	20:53:19	1088	66.3	51.2	0.9
4/22/2019	20:54:19	1087	66.5	52.8	0.9
4/22/2019	20:55:19	1090	66.7	52.9	0.8
4/22/2019	20:56:19	1083	66.8	51.2	1
4/22/2019	20:57:19	1075	66.7	50.2	0.9
4/22/2019	20:58:19	1065	66.5	49.7	0.9
4/22/2019	20:59:19	1062	66.3	49.4	0.9
4/22/2019	21:00:19	1062	65.9	48.5	0.9
4/22/2019	21:01:19	1061	65.7	49.1	0.9
4/22/2019	21:02:19	1058	65.8	51.5	0.9
4/22/2019	21:03:19	1063	65.9	53	0.9
4/22/2019	21:04:19	1064	65.8	51.2	1
4/22/2019	21:05:19	1062	65.7	50.2	0.8
4/22/2019	21:06:19	1068	65.9	51.9	0.8
4/22/2019	21:07:19	1079	66.1	53.5	0.9
4/22/2019	21:08:19	1076	66.3	53	0.9
4/22/2019	21:09:19	1070	66.5	51.8	0.9
4/22/2019	21:10:19	1057	66.6	50.9	0.9
4/22/2019	21:11:19	1048	66.6	50.5	0.9
4/22/2019	21:12:19	1038	66.5	50.2	0.9
4/22/2019	21:13:19	1030	66.3	49.8	0.8
4/22/2019	21:14:19	1028	65.9	48.7	0.8



4/22/2019	21:15:19	1023	65.7	49	0.7
4/22/2019	21:16:19	1020	65.8	51.6	0.8
4/22/2019	21:17:19	1019	65.8	53.2	0.8
4/22/2019	21:18:19	1022	65.8	51.8	0.8
4/22/2019	21:19:19	1019	65.8	50.3	0.9
4/22/2019	21:20:19	1020	65.9	52	0.8
4/22/2019	21:21:19	1026	66	53.6	0.9
4/22/2019	21:22:19	1029	66.2	53.6	0.9
4/22/2019	21:23:19	1022	66.4	52	0.8
4/22/2019	21:24:19	1014	66.3	50.7	0.9
4/22/2019	21:25:19	1006	66.1	50.3	0.8
4/22/2019	21:26:19	999	66.1	50.1	0.8
4/22/2019	21:27:19	995	66	49.8	0.8
4/22/2019	21:28:19	990	65.8	49.8	0.7
4/22/2019	21:29:19	987	65.8	49.7	0.8
4/22/2019	21:30:19	983	65.8	49.9	0.7
4/22/2019	21:31:19	979	65.9	49.7	0.7
4/22/2019	21:32:19	971	65.8	48.9	0.7
4/22/2019	21:33:19	965	65.9	50	0.6
4/22/2019	21:34:19	968	66	51.6	0.6
4/22/2019	21:35:19	968	66.2	52.3	0.7
4/22/2019	21:36:19	968	66.3	51.8	0.6
4/22/2019	21:37:19	962	66.4	50.4	0.7
4/22/2019	21:38:19	954	66.2	49.6	0.8
4/22/2019	21:39:19	952	66	49.3	0.7
4/22/2019	21:40:19	950	65.6	48.7	0.6
4/22/2019	21:41:19	952	65.4	48.6	0.7
4/22/2019	21:42:19	952	65.4	50.8	0.6
4/22/2019	21:43:19	952	65.4	52.6	0.6
4/22/2019	21:44:19	954	65.4	51.9	0.6
4/22/2019	21:45:19	957	65.3	49.9	0.7
4/22/2019	21:46:19	960	65.4	51.5	0.7
4/22/2019	21:47:19	959	65.7	52.7	0.7
4/22/2019	21:48:19	961	65.9	53.2	0.8

4/22/2019	21:49:19	963	66.1	52.3	0.7
4/22/2019	21:50:19	961	66.3	51.6	0.6
4/22/2019	21:51:19	964	66.4	50.8	0.8
4/22/2019	21:52:19	961	66.4	50.5	0.7
4/22/2019	21:53:19	960	66.3	49.9	0.8
4/22/2019	21:54:19	958	66	49.1	0.8
4/22/2019	21:55:19	950	65.6	48.6	0.7
4/22/2019	21:56:19	946	65.6	50.5	0.6
4/22/2019	21:57:19	947	65.7	53	0.6
4/22/2019	21:58:19	950	65.5	53.3	0.6
4/22/2019	21:59:19	949	65.3	50.8	0.6
4/22/2019	22:00:19	955	65.5	52	0.5
4/22/2019	22:01:19	972	65.8	53.9	0.8
4/22/2019	22:02:19	996	66	54.7	0.9
4/22/2019	22:03:19	1015	66.2	54.1	0.9
4/22/2019	22:04:19	1040	66.4	53.5	0.9
4/22/2019	22:05:19	1066	66.5	53.2	1
4/22/2019	22:06:19	1100	66.5	52.8	1
4/22/2019	22:07:19	1119	66.4	52.2	1
4/22/2019	22:08:19	1132	66.1	51	1
4/22/2019	22:09:19	1120	65.9	51.5	1
4/22/2019	22:10:19	1140	66	52.4	1
4/22/2019	22:11:19	1156	66.1	52.5	1.1
4/22/2019	22:12:19	1138	66.1	52.6	1
4/22/2019	22:13:19	1119	66.2	52.9	1
4/22/2019	22:14:19	1106	66.1	52.1	1
4/22/2019	22:15:19	1099	65.9	51.9	1
4/22/2019	22:16:19	1092	66.1	54	1
4/22/2019	22:17:19	1084	66.2	55.9	1
4/22/2019	22:18:19	1087	66.4	55	1.1
4/22/2019	22:19:19	1088	66.5	53.6	1.1
4/22/2019	22:20:19	1086	66.5	52.2	1
4/22/2019	22:21:19	1081	66.3	51.5	1
4/22/2019	22:22:19	1079	66	50.7	1

4/22/2019	22:23:19	1072	65.6	50.3	1
4/22/2019	22:24:19	1061	65.6	52.4	1
4/22/2019	22:25:19	1052	65.6	54.4	1
4/22/2019	22:26:19	1043	65.4	53.8	1
4/22/2019	22:27:19	1037	65.3	51.7	1
4/22/2019	22:28:19	1029	65.3	53.5	1
4/22/2019	22:29:19	1021	65.5	55.2	1
4/22/2019	22:30:19	1018	65.4	55.1	1
4/22/2019	22:31:19	1012	65.7	53.4	1
4/22/2019	22:32:19	1006	65.9	53.1	1
4/22/2019	22:33:19	997	65.9	52.3	1
4/22/2019	22:34:19	985	65.9	51.8	1
4/22/2019	22:35:19	979	65.7	51.3	1
4/22/2019	22:36:19	967	65.6	51	1
4/22/2019	22:37:19	954	65.4	51	0.9
4/22/2019	22:38:19	944	65.1	50.2	1
4/22/2019	22:39:19	936	65.1	51.2	0.9
4/22/2019	22:40:19	926	65.2	53.4	0.9
4/22/2019	22:41:19	922	65.3	54.5	0.9
4/22/2019	22:42:19	917	65.1	52.2	0.9
4/22/2019	22:43:19	915	64.9	51.8	0.9
4/22/2019	22:44:19	904	65.1	54	0.9
4/22/2019	22:45:19	904	65.3	55.3	0.9
4/22/2019	22:46:19	901	65.5	54.6	0.8
4/22/2019	22:47:19	894	65.7	53.1	0.9
4/22/2019	22:48:19	890	65.6	51.8	0.9
4/22/2019	22:49:19	899	65.4	51.1	1
4/22/2019	22:50:19	903	65.1	50.3	0.9
4/22/2019	22:51:19	906	65	52.4	0.8
4/22/2019	22:52:19	914	65.1	54.4	0.8
4/22/2019	22:53:19	913	65.1	54.8	0.9
4/22/2019	22:54:19	914	65	52.3	1
4/22/2019	22:55:19	912	65	53.1	0.9
4/22/2019	22:56:19	914	65.2	55	0.9

4/22/2019	22:57:19	915	65.4	55.7	1
4/22/2019	22:58:19	920	65.5	54.1	1
4/22/2019	22:59:19	917	65.6	53.4	1
4/22/2019	23:00:19	933	65.7	53	1
4/22/2019	23:01:19	919	65.8	52.3	0.9
4/22/2019	23:02:19	929	65.7	52	1
4/22/2019	23:03:19	918	65.4	50.6	0.9
4/22/2019	23:04:19	906	65.3	51	0.9
4/22/2019	23:05:19	895	65.3	53.1	0.8
4/22/2019	23:06:19	888	65.3	54.5	0.8
4/22/2019	23:07:19	885	65.1	52.6	0.8
4/22/2019	23:08:19	883	65.1	51.8	0.8
4/22/2019	23:09:19	884	65.2	53.8	0.8
4/22/2019	23:10:19	886	65.3	55.2	0.6
4/22/2019	23:11:19	885	65.1	53.7	0.8
4/22/2019	23:12:19	881	65.4	53	0.8
4/22/2019	23:13:19	887	65.5	52.7	0.7
4/22/2019	23:14:19	876	65.4	51.5	0.8
4/22/2019	23:15:19	867	65	50.4	0.7
4/22/2019	23:16:19	868	64.7	50.3	0.8
4/22/2019	23:17:19	876	64.7	52.4	0.6
4/22/2019	23:18:19	893	64.9	54.2	0.7
4/22/2019	23:19:19	898	65	54.2	0.6
4/22/2019	23:20:19	906	65.1	52.8	0.6
4/22/2019	23:21:19	900	65.2	52.3	0.6
4/22/2019	23:22:19	892	65.2	52.2	0.5
4/22/2019	23:23:19	879	65.3	52.1	0.4
4/22/2019	23:24:19	872	65.2	51.2	0.6
4/22/2019	23:25:19	867	65.3	51.6	0.5
4/22/2019	23:26:19	866	65.4	51.5	0.4
4/22/2019	23:27:19	867	65.3	50.5	0.4
4/22/2019	23:28:19	868	64.9	49.4	0.3
4/22/2019	23:29:19	866	64.7	50	0.4
4/22/2019	23:30:19	867	64.8	52.3	0.4

4/22/2019	23:31:19	869	64.8	53.8	0.3
4/22/2019	23:32:19	872	64.8	52.4	0.4
4/22/2019	23:33:19	879	64.7	51.7	0.3
4/22/2019	23:34:19	878	64.9	53.6	0.3
4/22/2019	23:35:19	888	65	55	0.4
4/22/2019	23:36:19	888	64.9	53.6	0.4
4/22/2019	23:37:19	882	64.8	52.3	0.4
4/22/2019	23:38:19	877	64.9	54.4	0.4
4/22/2019	23:39:19	887	65.1	55.8	0.5
4/22/2019	23:40:19	887	65.2	55.2	0.4
4/22/2019	23:41:19	900	65.4	53.9	0.4
4/22/2019	23:42:19	900	65.3	52.6	0.5
4/22/2019	23:43:19	891	65.2	51.5	0.8
4/22/2019	23:44:19	870	65.1	51.2	0.6
4/22/2019	23:45:19	863	64.8	51.2	0.5
4/22/2019	23:46:19	867	65	51.6	0.5
4/22/2019	23:47:19	876	64.9	51.4	0.5
4/22/2019	23:48:19	880	65	51.1	0.4
4/22/2019	23:49:19	916	65.1	51.1	0.4
4/22/2019	23:50:19	909	65.3	52	0.4
4/22/2019	23:51:19	912	65.4	53.3	0.4
4/22/2019	23:52:19	917	65.6	53.3	0.5
4/22/2019	23:53:19	933	65.7	52.9	0.5
4/22/2019	23:54:19	935	65.9	52.7	0.5
4/22/2019	23:55:19	934	66.1	52.7	0.3
4/22/2019	23:56:19	939	66.2	53.2	0.4
4/22/2019	23:57:19	949	66.4	54.6	0.5
4/22/2019	23:58:19	950	66.3	56.9	0.5
4/22/2019	23:59:19	945	66.2	57.4	0.4
4/23/2019	0:00:19	935	66.1	57.6	0.5
4/23/2019	0:01:19	928	65.9	58.7	0.3
4/23/2019	0:02:19	923	65.9	58.4	0.4
4/23/2019	0:03:19	922	65.7	57.6	0.4
4/23/2019	0:04:19	919	65.6	58.3	0.4

4/23/2019	0:05:19	917	65.5	59.5	0.3
4/23/2019	0:06:19	923	65.5	60.3	0.5
4/23/2019	0:07:19	929	65.6	59.8	0.5
4/23/2019	0:08:19	931	65.5	59.5	0.5
4/23/2019	0:09:19	945	65.5	60.7	0.5
4/23/2019	0:10:19	986	65.5	62.7	0.5
4/23/2019	0:11:19	986	65.5	64.9	0.5
4/23/2019	0:12:19	974	65.5	65	0.5
4/23/2019	0:13:19	977	65.5	64.7	0.5
4/23/2019	0:14:19	987	65.5	63.7	0.5
4/23/2019	0:15:19	984	65.4	63	0.4
4/23/2019	0:16:19	1000	65.5	63.4	0.5
4/23/2019	0:17:19	1017	65.7	63.7	0.5
4/23/2019	0:18:19	1027	65.9	63.5	0.4
4/23/2019	0:19:19	1032	66	63.5	0.5
4/23/2019	0:20:19	1040	66.2	63.5	0.4
4/23/2019	0:21:19	1046	66.3	63.7	0.4
4/23/2019	0:22:19	1030	66.4	63	0.4
4/23/2019	0:23:19	1008	66.1	61.1	0.3
4/23/2019	0:24:19	991	66	59.7	0.4
4/23/2019	0:25:19	970	65.9	60	0.3
4/23/2019	0:26:19	951	65.7	60.6	0.2
4/23/2019	0:27:19	939	65.4	59.4	0.2
4/23/2019	0:28:19	933	65.2	59.1	0.2
4/23/2019	0:29:19	922	65.1	60.1	0.1
4/23/2019	0:30:19	911	65	60.8	0.2
4/23/2019	0:31:19	904	64.9	60	0.1
4/23/2019	0:32:19	900	64.8	58.8	0.1
4/23/2019	0:33:19	892	64.7	59.3	0.1
4/23/2019	0:34:19	883	64.7	60.3	0.1
4/23/2019	0:35:19	885	64.8	60.4	0.1
4/23/2019	0:36:19	906	65	60.3	0.2
4/23/2019	0:37:19	916	65.2	60.7	0.2
4/23/2019	0:38:19	920	65.4	60.7	0.2



4/23/2019	0:39:19	930	65.6	60.8	0.1
4/23/2019	0:40:19	934	65.7	60.7	0.2
4/23/2019	0:41:19	940	65.9	60.8	0.2
4/23/2019	0:42:19	948	66	61.1	0.1
4/23/2019	0:43:19	949	66.1	60.9	0.2
4/23/2019	0:44:19	934	66	58.9	0.1
4/23/2019	0:45:19	911	65.8	57.6	0.3
4/23/2019	0:46:19	899	65.5	58.1	0.2
4/23/2019	0:47:19	889	65.4	59.3	0.1
4/23/2019	0:48:19	879	65.3	59.4	0.1
4/23/2019	0:49:19	874	65.3	58.2	0.1
4/23/2019	0:50:19	871	65	57.6	0.1
4/23/2019	0:51:19	865	64.8	57	0.1
4/23/2019	0:52:19	862	64.6	56.5	0.1
4/23/2019	0:53:19	855	64.4	56.2	0.1
4/23/2019	0:54:19	860	64.7	57	0.1
4/23/2019	0:55:19	877	64.9	57.3	0.1
4/23/2019	0:56:19	880	65	57.7	0.1
4/23/2019	0:57:19	889	65.2	57.9	0.1
4/23/2019	0:58:19	901	65.4	58	0.1
4/23/2019	0:59:19	905	65.5	58	0.1
4/23/2019	1:00:19	912	65.6	58	0.2
4/23/2019	1:01:19	916	65.7	58.3	0.2
4/23/2019	1:02:19	919	65.8	58.2	0.1
4/23/2019	1:03:19	920	65.9	57.8	0.2
4/23/2019	1:04:19	914	65.9	56.8	0.1
4/23/2019	1:05:19	909	65.8	55.7	0.1
4/23/2019	1:06:19	900	65.4	54.8	0.1
4/23/2019	1:07:19	889	65.2	54.9	0.1
4/23/2019	1:08:19	876	65.1	56.1	0.1
4/23/2019	1:09:19	871	64.9	56.9	0.1
4/23/2019	1:10:19	867	64.7	55.7	0.1
4/23/2019	1:11:19	865	64.7	56.1	0.1
4/23/2019	1:12:19	857	64.6	57.2	0

4/23/2019	1:13:19	853	64.7	57.7	0.1
4/23/2019	1:14:19	872	64.9	57.6	0.1
4/23/2019	1:15:19	880	65	58	0.1
4/23/2019	1:16:19	888	65.2	57.8	0.1
4/23/2019	1:17:19	894	65.3	57.9	0.1
4/23/2019	1:18:19	904	65.5	57.8	0.1
4/23/2019	1:19:19	906	65.6	57.7	0.1
4/23/2019	1:20:19	915	65.7	57.8	0.2
4/23/2019	1:21:19	924	65.8	57.8	0.1
4/23/2019	1:22:19	922	65.9	57.8	0.1
4/23/2019	1:23:19	932	66	57.8	0.1
4/23/2019	1:24:19	941	66.1	57.9	0.1
4/23/2019	1:25:19	940	66.2	58	0.2
4/23/2019	1:26:19	943	66.2	57.9	0.1
4/23/2019	1:27:19	954	66.3	58.1	0.1
4/23/2019	1:28:19	939	66.2	57.2	0.1
4/23/2019	1:29:19	916	66.1	56	0.1
4/23/2019	1:30:19	904	65.8	55.3	0.1
4/23/2019	1:31:19	896	65.6	55.1	0.2
4/23/2019	1:32:19	890	65.3	54.9	0.1
4/23/2019	1:33:19	879	64.9	54	0.1
4/23/2019	1:34:19	868	64.6	54.2	0.1
4/23/2019	1:35:19	854	64.4	55.8	0.1
4/23/2019	1:36:19	850	64.4	57	0.1
4/23/2019	1:37:19	861	64.6	57.3	0.1
4/23/2019	1:38:19	878	64.8	57.4	0
4/23/2019	1:39:19	884	65	57.5	0
4/23/2019	1:40:19	897	65.2	57.4	0.1
4/23/2019	1:41:19	905	65.3	57.4	0
4/23/2019	1:42:19	908	65.5	57.3	0.1
4/23/2019	1:43:19	905	65.6	57.3	0.2
4/23/2019	1:44:19	911	65.7	57.1	0.1
4/23/2019	1:45:19	918	65.8	57.1	0.1
4/23/2019	1:46:19	916	65.9	57	0.1

4/23/2019	1:47:19	922	65.9	57	0.1
4/23/2019	1:48:19	926	66	57	0.1
4/23/2019	1:49:19	934	66.1	57.1	0
4/23/2019	1:50:19	941	66.1	57.2	0.2
4/23/2019	1:51:19	945	66.2	57.2	0.1
4/23/2019	1:52:19	959	66.3	57.4	0.1
4/23/2019	1:53:19	966	66.3	57.3	0
4/23/2019	1:54:19	967	66.4	57.3	0.1
4/23/2019	1:55:19	979	66.4	57.4	0.1
4/23/2019	1:56:19	974	66.5	57.4	0
4/23/2019	1:57:19	975	66.5	57.6	0
4/23/2019	1:58:19	980	66.6	57.5	0.1
4/23/2019	1:59:19	983	66.6	57.5	0.1
4/23/2019	2:00:19	988	66.6	57.5	0.1
4/23/2019	2:01:19	987	66.7	57.5	0.1
4/23/2019	2:02:19	994	66.7	57.6	0.1
4/23/2019	2:03:19	997	66.7	57.7	0
4/23/2019	2:04:19	999	66.7	57.9	0.1
4/23/2019	2:05:19	983	66.8	59	0.4
4/23/2019	2:06:19	959	66.9	59.2	0.7
4/23/2019	2:07:19	939	66.9	58.5	0.4
4/23/2019	2:08:19	929	67	58.4	0.3
4/23/2019	2:09:19	908	67	58	0.4
4/23/2019	2:10:19	903	67	58	0.3
4/23/2019	2:11:19	904	67.1	58.3	0.3
4/23/2019	2:12:19	902	67.1	58	0.3
4/23/2019	2:13:19	904	67.1	58	0.3
4/23/2019	2:14:19	907	67.1	58.2	0.1
4/23/2019	2:15:19	904	67.1	58.2	0.2
4/23/2019	2:16:19	886	67.1	58.2	0.2
4/23/2019	2:17:19	857	67.1	57.6	0.3
4/23/2019	2:18:19	826	67.1	57.2	0.4
4/23/2019	2:19:19	811	67.1	57	0.4
4/23/2019	2:20:19	808	67.1	56.9	0.4

4/23/2019	2:21:19	807	67.1	57	0.4
4/23/2019	2:22:19	811	67.1	57.1	0.4
4/23/2019	2:23:19	809	67.1	57.2	0.4
4/23/2019	2:24:19	808	67.2	57.1	0.4
4/23/2019	2:25:19	802	67.2	56.9	0.2
4/23/2019	2:26:19	798	67.2	56.6	0.3
4/23/2019	2:27:19	797	67.2	56.8	0.1
4/23/2019	2:28:19	801	67.3	57	0.2
4/23/2019	2:29:19	797	67.3	56.9	0.2
4/23/2019	2:30:19	795	67.3	57.1	0.2
4/23/2019	2:31:19	784	67.2	57.2	0.2
4/23/2019	2:32:19	779	67.2	57.1	0.2
4/23/2019	2:33:19	772	67.2	56.8	0.2
4/23/2019	2:34:19	766	67.2	56.6	0.2
4/23/2019	2:35:19	764	67.2	56.4	0.2
4/23/2019	2:36:19	760	67.2	56.2	0.4
4/23/2019	2:37:19	760	67.2	56.3	0.2
4/23/2019	2:38:19	759	67.2	56.3	0.2
4/23/2019	2:39:19	757	67.2	56	0.3
4/23/2019	2:40:19	753	67.2	56	0.3
4/23/2019	2:41:19	752	67.2	56.2	0.2
4/23/2019	2:42:19	753	67.2	56.7	0.1
4/23/2019	2:43:19	775	67.3	57.6	0.1
4/23/2019	2:44:19	790	67.3	57.6	0.1
4/23/2019	2:45:19	796	67.4	57.5	0.2
4/23/2019	2:46:19	812	67.4	57.6	0.2
4/23/2019	2:47:19	831	67.4	57.5	0.1
4/23/2019	2:48:19	828	67.4	57.5	0.2
4/23/2019	2:49:19	845	67.5	57.5	0.1
4/23/2019	2:50:19	855	67.5	57.6	0.1
4/23/2019	2:51:19	866	67.5	57.7	0.1
4/23/2019	2:52:19	873	67.5	57.7	0.1
4/23/2019	2:53:19	881	67.5	57.7	0.1
4/23/2019	2:54:19	883	67.5	57.7	0.1

4/23/2019	2:55:19	889	67.5	57.8	0.2
4/23/2019	2:56:19	898	67.5	57.9	0.1
4/23/2019	2:57:19	903	67.5	57.9	0.2
4/23/2019	2:58:19	895	67.5	57.9	0.1
4/23/2019	2:59:19	900	67.5	57.9	0.1
4/23/2019	3:00:19	910	67.5	58.1	0.1
4/23/2019	3:01:19	918	67.5	58.1	0.1
4/23/2019	3:02:19	922	67.5	58.2	0.1
4/23/2019	3:03:19	927	67.5	58.2	0.1
4/23/2019	3:04:19	932	67.5	58.3	0.1
4/23/2019	3:05:19	934	67.5	58.3	0
4/23/2019	3:06:19	939	67.5	58.3	0.1
4/23/2019	3:07:19	942	67.5	58.4	0.1
4/23/2019	3:08:19	945	67.5	58.4	0
4/23/2019	3:09:19	947	67.5	58.4	0.1
4/23/2019	3:10:19	949	67.6	58.5	0
4/23/2019	3:11:19	957	67.5	58.5	0.1
4/23/2019	3:12:19	958	67.5	58.6	0.1
4/23/2019	3:13:19	962	67.6	58.6	0.1
4/23/2019	3:14:19	958	67.6	58.6	0.1
4/23/2019	3:15:19	963	67.6	58.7	0
4/23/2019	3:16:19	972	67.6	58.8	0
4/23/2019	3:17:19	973	67.6	58.8	0.1
4/23/2019	3:18:19	975	67.6	58.9	0
4/23/2019	3:19:19	983	67.6	58.9	0
4/23/2019	3:20:19	984	67.6	59	0
4/23/2019	3:21:19	984	67.6	59.1	0
4/23/2019	3:22:19	988	67.6	59.1	0.1
4/23/2019	3:23:19	992	67.6	59.2	0
4/23/2019	3:24:19	996	67.6	59.3	0
4/23/2019	3:25:19	1000	67.6	59.4	0
4/23/2019	3:26:19	1006	67.6	59.5	0
4/23/2019	3:27:19	1011	67.6	59.6	0.1
4/23/2019	3:28:19	1011	67.6	59.7	0

4/23/2019	3:29:19	1008	67.6	59.6	0.1
4/23/2019	3:30:19	1009	67.6	59.7	0
4/23/2019	3:31:19	1017	67.6	60	0
4/23/2019	3:32:19	1018	67.7	60.2	0.6
4/23/2019	3:33:19	1015	67.7	60.1	1.2
4/23/2019	3:34:19	1019	67.8	60.2	1
4/23/2019	3:35:19	1022	67.8	60.1	0.9
4/23/2019	3:36:19	1028	67.8	60.2	0.8
4/23/2019	3:37:19	1033	67.8	60.2	0.8
4/23/2019	3:38:19	1036	67.9	60.2	0.9
4/23/2019	3:39:19	1036	67.9	60.1	0.7
4/23/2019	3:40:19	1039	67.9	60.1	0.8
4/23/2019	3:41:19	1037	67.9	60	0.7
4/23/2019	3:42:19	1039	67.9	60.1	0.8
4/23/2019	3:43:19	1043	67.9	60.1	0.7
4/23/2019	3:44:19	1052	67.9	60.1	0.6
4/23/2019	3:45:19	1054	68	60.1	0.6
4/23/2019	3:46:19	1051	68	60	0.6
4/23/2019	3:47:19	1056	68	60	0.6
4/23/2019	3:48:19	1056	68	60	0.5
4/23/2019	3:49:19	1065	68	60	0.7
4/23/2019	3:50:19	1069	68.1	60	0.5
4/23/2019	3:51:19	1071	68.1	59.9	0.5
4/23/2019	3:52:19	1074	68.1	59.9	0.5
4/23/2019	3:53:19	1076	68	60.3	0.5
4/23/2019	3:54:19	1055	68	60.7	0.3
4/23/2019	3:55:19	1044	68	60.6	0.5
4/23/2019	3:56:19	1036	68.1	60.7	0.4
4/23/2019	3:57:19	1039	68	60.5	0.4
4/23/2019	3:58:19	1036	68	60.4	0.4
4/23/2019	3:59:19	1035	68	60.4	0.4
4/23/2019	4:00:19	1020	68	60.3	0.2
4/23/2019	4:01:19	1011	68	60.1	0.2
4/23/2019	4:02:19	974	68	60	0.3



4/23/2019	4:03:19	948	67.9	59.8	0.2
4/23/2019	4:04:19	921	67.9	59.4	0.2
4/23/2019	4:05:19	905	67.9	59.3	0.2
4/23/2019	4:06:19	883	67.8	59	0.2
4/23/2019	4:07:19	861	67.8	58.7	0.1
4/23/2019	4:08:19	860	67.9	58.5	0.2
4/23/2019	4:09:19	844	67.9	58.3	0.1
4/23/2019	4:10:19	847	67.8	58.4	0.2
4/23/2019	4:11:19	841	67.8	58.1	0.1
4/23/2019	4:12:19	836	67.9	58.1	0.1
4/23/2019	4:13:19	841	67.9	58.4	0.1
4/23/2019	4:14:19	841	67.9	58.5	0.1
4/23/2019	4:15:19	837	67.9	58.6	0.1
4/23/2019	4:16:19	827	67.9	58.5	0.1
4/23/2019	4:17:19	815	67.8	58.5	0.1
4/23/2019	4:18:19	805	67.8	58.4	0.1
4/23/2019	4:19:19	798	67.8	58.3	0.1
4/23/2019	4:20:19	787	67.7	58.1	0.1
4/23/2019	4:21:19	775	67.7	57.9	0.1
4/23/2019	4:22:19	769	67.7	57.6	0.2
4/23/2019	4:23:19	761	67.7	57.5	0.2
4/23/2019	4:24:19	762	67.7	57.7	0.1
4/23/2019	4:25:19	761	67.7	57.7	0.2
4/23/2019	4:26:19	763	67.7	57.7	0.2
4/23/2019	4:27:19	760	67.7	57.7	0
4/23/2019	4:28:19	758	67.7	57.6	0.1
4/23/2019	4:29:19	758	67.7	57.5	0.1
4/23/2019	4:30:19	754	67.8	57.8	0.1
4/23/2019	4:31:19	750	67.7	57.8	0
4/23/2019	4:32:19	744	67.7	57.8	0
4/23/2019	4:33:19	740	67.7	57.8	0.1
4/23/2019	4:34:19	730	67.6	57.5	0.1
4/23/2019	4:35:19	731	67.7	57.5	0.1
4/23/2019	4:36:19	723	67.6	57.2	0.2

4/23/2019	4:37:19	720	67.6	57	0.2
4/23/2019	4:38:19	718	67.6	57	0.1
4/23/2019	4:39:19	716	67.6	57	0.2
4/23/2019	4:40:19	719	67.6	57.1	0.1
4/23/2019	4:41:19	730	67.6	57.6	0.1
4/23/2019	4:42:19	744	67.7	57.7	0
4/23/2019	4:43:19	754	67.7	57.9	0.1
4/23/2019	4:44:19	761	67.7	58.2	0
4/23/2019	4:45:19	768	67.8	58.4	0.1
4/23/2019	4:46:19	774	67.8	58.4	0.3
4/23/2019	4:47:19	790	67.8	58.5	0.5
4/23/2019	4:48:19	797	67.8	58.4	0.5
4/23/2019	4:49:19	812	67.9	58.4	0.6
4/23/2019	4:50:19	826	67.9	58.4	0.4
4/23/2019	4:51:19	830	67.9	58.4	0.4
4/23/2019	4:52:19	833	67.9	58.5	0.4
4/23/2019	4:53:19	842	67.9	58.6	0.3
4/23/2019	4:54:19	847	67.9	58.5	0.4
4/23/2019	4:55:19	854	67.9	58.5	0.3
4/23/2019	4:56:19	847	67.9	58.6	0.3
4/23/2019	4:57:19	855	67.9	58.7	0.3
4/23/2019	4:58:19	857	67.9	58.9	0.3
4/23/2019	4:59:19	859	67.9	58.9	0.2
4/23/2019	5:00:19	857	67.9	58.8	0.2
4/23/2019	5:01:19	865	67.9	58.9	0.2
4/23/2019	5:02:19	869	67.9	59	0.1
4/23/2019	5:03:19	876	67.8	59.1	0.2
4/23/2019	5:04:19	877	67.9	59	0.1
4/23/2019	5:05:19	878	67.9	58.9	0.1
4/23/2019	5:06:19	877	67.9	59	0.2
4/23/2019	5:07:19	867	67.9	59	0.1
4/23/2019	5:08:19	866	67.9	59	0.1
4/23/2019	5:09:19	858	67.9	58.9	0.2
4/23/2019	5:10:19	847	67.9	58.9	0.1

4/23/2019	5:11:19	843	67.9	58.8	0.2
4/23/2019	5:12:19	836	67.8	58.8	0.1
4/23/2019	5:13:19	834	67.8	58.9	0.1
4/23/2019	5:14:19	836	67.8	59	0.1
4/23/2019	5:15:19	833	67.8	58.9	0.1
4/23/2019	5:16:19	829	67.8	58.9	0.1
4/23/2019	5:17:19	825	67.8	59	0.1
4/23/2019	5:18:19	820	67.8	58.9	0.1
4/23/2019	5:19:19	817	67.8	58.9	0.1
4/23/2019	5:20:19	816	67.8	58.9	0.1
4/23/2019	5:21:19	812	67.8	58.9	0.1
4/23/2019	5:22:19	811	67.8	58.9	0.1
4/23/2019	5:23:19	807	67.8	58.8	0
4/23/2019	5:24:19	804	67.8	58.7	0.1
4/23/2019	5:25:19	804	67.8	58.7	0
4/23/2019	5:26:19	801	67.8	58.8	0
4/23/2019	5:27:19	799	67.8	58.7	0
4/23/2019	5:28:19	796	67.8	58.7	0
4/23/2019	5:29:19	796	67.7	58.8	0
4/23/2019	5:30:19	795	67.8	58.8	0
4/23/2019	5:31:19	795	67.8	58.7	0
4/23/2019	5:32:19	789	67.8	58.7	0
4/23/2019	5:33:19	787	67.8	58.7	0
4/23/2019	5:34:19	786	67.8	58.6	0
4/23/2019	5:35:19	781	67.8	58.5	0
4/23/2019	5:36:19	780	67.8	58.5	0
4/23/2019	5:37:19	777	67.8	58.6	0
4/23/2019	5:38:19	775	67.8	58.5	0.1
4/23/2019	5:39:19	774	67.7	58.5	0
4/23/2019	5:40:19	777	67.7	58.6	0.1
4/23/2019	5:41:19	776	67.7	58.7	0.1
4/23/2019	5:42:19	797	67.7	58.9	0.1
4/23/2019	5:43:19	815	67.7	58.9	0.1
4/23/2019	5:44:19	828	67.7	59	0.1

4/23/2019	5:45:19	845	67.7	59	0.1
4/23/2019	5:46:19	847	67.7	59	0.1
4/23/2019	5:47:19	852	67.7	59	0
4/23/2019	5:48:19	853	67.7	59.1	0.1
4/23/2019	5:49:19	862	67.8	59.1	0.1
4/23/2019	5:50:19	867	67.8	59.2	0.2
4/23/2019	5:51:19	878	67.8	59.2	0.1
4/23/2019	5:52:19	887	67.8	59.3	0.1
4/23/2019	5:53:19	890	67.8	59.3	0.1
4/23/2019	5:54:19	892	67.8	59.3	0.1
4/23/2019	5:55:19	897	67.8	59.3	0.1
4/23/2019	5:56:19	903	67.8	59.4	0.1
4/23/2019	5:57:19	906	67.8	59.4	0.2
4/23/2019	5:58:19	910	67.7	59.4	0.1
4/23/2019	5:59:19	907	67.7	59.4	0.2
4/23/2019	6:00:19	908	67.7	59.5	0.2
4/23/2019	6:01:19	906	67.7	59.7	0.1
4/23/2019	6:02:19	914	67.8	59.8	0.1
4/23/2019	6:03:19	914	67.8	59.7	0.1
4/23/2019	6:04:19	922	67.8	59.7	0.1
4/23/2019	6:05:19	935	67.8	59.8	0.1
4/23/2019	6:06:19	942	67.8	59.8	0.1
4/23/2019	6:07:19	956	67.8	59.8	0.1
4/23/2019	6:08:19	961	67.8	59.9	0.1
4/23/2019	6:09:19	962	67.8	59.8	0.1
4/23/2019	6:10:19	964	67.8	59.9	0.1
4/23/2019	6:11:19	971	67.8	59.9	0.1
4/23/2019	6:12:19	976	67.8	59.9	0.1
4/23/2019	6:13:19	981	67.8	59.9	0.1
4/23/2019	6:14:19	983	67.8	59.9	0.1
4/23/2019	6:15:19	972	67.8	59.8	0.1
4/23/2019	6:16:19	967	67.8	59.8	0.1
4/23/2019	6:17:19	979	67.8	59.9	0.1
4/23/2019	6:18:19	994	67.8	59.9	0.1

4/23/2019	6:19:19	1002	67.8	59.9	0
4/23/2019	6:20:19	992	67.8	59.9	0.1
4/23/2019	6:21:19	990	67.8	59.9	0.1
4/23/2019	6:22:19	997	67.8	59.9	0
4/23/2019	6:23:19	1000	67.8	59.9	0
4/23/2019	6:24:19	1003	67.8	59.9	0
4/23/2019	6:25:19	1009	67.8	59.9	0
4/23/2019	6:26:19	1008	67.8	59.9	0
4/23/2019	6:27:19	1016	67.8	59.9	0.1
4/23/2019	6:28:19	1014	67.8	60	0.1
4/23/2019	6:29:19	1020	67.8	60	0
4/23/2019	6:30:19	1023	67.8	60	0.1
4/23/2019	6:31:19	1027	67.7	60.1	0
4/23/2019	6:32:19	1023	67.8	60	0.1
4/23/2019	6:33:19	1028	67.8	60.1	0
4/23/2019	6:34:19	1045	67.7	60.2	0
4/23/2019	6:35:19	1046	67.8	60.2	0.1
4/23/2019	6:36:19	1046	67.7	60.2	0
4/23/2019	6:37:19	1046	67.7	60.2	0
4/23/2019	6:38:19	1048	67.7	60.3	0.1
4/23/2019	6:39:19	1054	67.8	60.3	0
4/23/2019	6:40:19	1064	67.7	60.4	0.1
4/23/2019	6:41:19	1080	67.8	60.8	0.2
4/23/2019	6:42:19	1086	67.9	60.9	0.4
4/23/2019	6:43:19	1089	67.9	60.8	0.4
4/23/2019	6:44:19	1083	68	60.7	0.6
4/23/2019	6:45:19	1085	68	60.5	0.5
4/23/2019	6:46:19	1081	68	60.4	0.6
4/23/2019	6:47:19	1078	68	60.5	0.5
4/23/2019	6:48:19	1073	68	60.5	0.5
4/23/2019	6:49:19	1059	68	60	0.4
4/23/2019	6:50:19	1042	67.8	58.7	0.4
4/23/2019	6:51:19	1014	67.5	57.3	0.3
4/23/2019	6:52:19	991	67.2	56.2	0.4

4/23/2019	6:53:19	981	66.9	57	0.4
4/23/2019	6:54:19	981	67	57.4	0.4
4/23/2019	6:55:19	996	67	58	0.4
4/23/2019	6:56:19	1014	67	58.4	0.5
4/23/2019	6:57:19	1021	67	58.6	0.4
4/23/2019	6:58:19	1031	67.1	58.7	0.4
4/23/2019	6:59:19	1044	67.1	59.3	0.5
4/23/2019	7:00:19	1040	67.2	59.1	0.5
4/23/2019	7:01:19	1028	67.2	58.9	0.4
4/23/2019	7:02:19	1031	67.2	58.8	0.3
4/23/2019	7:03:19	1037	67.3	59	0.4
4/23/2019	7:04:19	1040	67.3	59.1	0.4
4/23/2019	7:05:19	1046	67.4	60	0.4
4/23/2019	7:06:19	1059	67.4	61.8	0.5
4/23/2019	7:07:19	1054	67.5	61.4	0.5
4/23/2019	7:08:19	1053	67.5	61.1	0.5
4/23/2019	7:09:19	1052	67.6	60.9	0.5
4/23/2019	7:10:19	1061	67.6	61.7	0.5
4/23/2019	7:11:19	1075	67.6	62.4	0.6
4/23/2019	7:12:19	1085	67.7	63	0.5
4/23/2019	7:13:19	1097	67.7	63.6	0.5
4/23/2019	7:14:19	1110	67.8	64.5	0.5
4/23/2019	7:15:19	1117	67.8	64.8	0.4
4/23/2019	7:16:19	1135	67.8	65.1	0.5
4/23/2019	7:17:19	1194	67.9	67.4	0.5
4/23/2019	7:18:19	1238	68	69.1	0.4
4/23/2019	7:19:19	1275	68.1	69.7	0.3
4/23/2019	7:20:19	1291	68.1	70.3	0.4
4/23/2019	7:21:19	1356	68.2	69.8	0.5
4/23/2019	7:22:19	1337	68.3	70.2	0.5
4/23/2019	7:23:19	1362	68.4	70	0.4
4/23/2019	7:24:19	1381	68.4	70	0.5
4/23/2019	7:25:19	1370	68.4	69.8	0.4
4/23/2019	7:26:19	1369	68.4	69.3	0.4



4/23/2019	7:27:19	1356	68.5	69	0.6
4/23/2019	7:28:19	1340	68.4	68.6	0.4
4/23/2019	7:29:19	1308	68.4	68.2	0.4
4/23/2019	7:30:19	1280	68.3	68	0.4
4/23/2019	7:31:19	1219	68.4	68.1	0.4
4/23/2019	7:32:19	1219	68.4	68.3	0.4
4/23/2019	7:33:19	1192	68.4	68.2	0.3
4/23/2019	7:34:19	1130	68.4	67.8	0.3
4/23/2019	7:35:19	1100	68.4	67.8	0.2
4/23/2019	7:36:19	1072	68.4	67.6	0.2
4/23/2019	7:37:19	1080	68.4	67.7	0.2
4/23/2019	7:38:19	1061	68.3	67.6	0.1
4/23/2019	7:39:19	1064	68.3	67.8	0.2
4/23/2019	7:40:19	1047	68.4	67.2	0.2
4/23/2019	7:41:19	1060	68.4	67.5	0.2
4/23/2019	7:42:19	1057	68.4	67.2	0.2
4/23/2019	7:43:19	1037	68.3	66.5	0.2
4/23/2019	7:44:19	1011	68.4	66.2	0.2
4/23/2019	7:45:19	1010	68.4	66.5	0.2
4/23/2019	7:46:19	1016	68.4	66.7	0.2
4/23/2019	7:47:19	1008	68.4	66.8	0.1
4/23/2019	7:48:19	987	68.5	66.5	0.2
4/23/2019	7:49:19	991	68.5	66.3	0.2
4/23/2019	7:50:19	986	68.5	66.2	0.1
4/23/2019	7:51:19	966	68.3	64.9	0.1
4/23/2019	7:52:19	926	67.3	61.5	0.2
4/23/2019	7:53:19	902	66.5	61.3	0.3
4/23/2019	7:54:19	891	66.3	62.9	0.5
4/23/2019	7:55:19	894	66.3	65	0.9
4/23/2019	7:56:19	886	66.4	66.4	0.9
4/23/2019	7:57:19	883	66.8	65.7	1
4/23/2019	7:58:19	881	67	66	0.9
4/23/2019	7:59:19	872	67.1	64.8	1
4/23/2019	8:00:19	864	67.3	65	1

4/23/2019	8:01:19	868	67.4	65.3	0.9
4/23/2019	8:02:19	872	67.5	65.1	0.9
4/23/2019	8:03:19	866	67.7	65.2	0.8
4/23/2019	8:04:19	864	67.8	65	0.9
4/23/2019	8:05:19	862	67.9	65.1	0.9
4/23/2019	8:06:19	860	67.9	65.3	0.9
4/23/2019	8:07:19	865	68	65.4	0.9
4/23/2019	8:08:19	860	68.1	65.2	0.9
4/23/2019	8:09:19	865	68.2	65.1	0.9
4/23/2019	8:10:19	862	68.2	64.9	1
4/23/2019	8:11:19	861	68.3	65	1
4/23/2019	8:12:19	860	68.3	64.9	0.9
4/23/2019	8:13:19	860	68.4	64.8	1
4/23/2019	8:14:19	862	68.3	64.4	1
4/23/2019	8:15:19	852	68.3	64.4	1
4/23/2019	8:16:19	839	68.4	64.5	0.9
4/23/2019	8:17:19	844	68.4	64.3	1
4/23/2019	8:18:19	847	68.4	63.9	0.9
4/23/2019	8:19:19	845	68.4	63.7	0.9
4/23/2019	8:20:19	838	68.4	63.4	0.9
4/23/2019	8:21:19	833	68.5	63.3	0.8
4/23/2019	8:22:19	827	68.5	63.2	0.8
4/23/2019	8:23:19	828	68.6	63.3	0.8
4/23/2019	8:24:19	821	68.6	62.8	0.9
4/23/2019	8:25:19	818	68.6	62.9	0.9
4/23/2019	8:26:19	813	68.6	63.1	0.7
4/23/2019	8:27:19	821	68.7	63.2	0.9
4/23/2019	8:28:19	818	68.8	63.1	0.8
4/23/2019	8:29:19	812	68.4	62	0.9
4/23/2019	8:30:19	814	67.9	59.5	0.8
4/23/2019	8:31:19	811	67.5	59.5	0.9
4/23/2019	8:32:19	809	67.3	59.6	0.9
4/23/2019	8:33:19	807	66.8	59.1	0.7
4/23/2019	8:34:19	807	66	58.5	0.8

4/23/2019	8:35:19	806	66.1	59.4	0.7
4/23/2019	8:36:19	804	66.5	60.5	0.7
4/23/2019	8:37:19	800	66.8	60.7	0.8
4/23/2019	8:38:19	796	67	60.9	0.6
4/23/2019	8:39:19	792	67.2	60.8	0.6
4/23/2019	8:40:19	792	67.4	60.6	0.6
4/23/2019	8:41:19	792	67.5	60.6	0.6
4/23/2019	8:42:19	788	67.7	60.6	0.7
4/23/2019	8:43:19	787	67.8	60.5	0.6
4/23/2019	8:44:19	787	68	60.6	0.5
4/23/2019	8:45:19	783	68.1	60.6	0.6
4/23/2019	8:46:19	773	68.1	60.7	0.4
4/23/2019	8:47:19	779	68.2	60.5	0.5
4/23/2019	8:48:19	778	68.3	60.2	0.6
4/23/2019	8:49:19	783	68.3	59.7	0.6
4/23/2019	8:50:19	783	68.3	59.3	0.5
4/23/2019	8:51:19	777	68.3	58.9	0.5
4/23/2019	8:52:19	776	68.4	58.8	0.5
4/23/2019	8:53:19	776	68.4	58.3	0.5
4/23/2019	8:54:19	777	68.5	58.5	0.5
4/23/2019	8:55:19	776	68.5	58.6	0.4
4/23/2019	8:56:19	774	68.6	58.4	0.3
4/23/2019	8:57:19	774	68.7	58.6	0.2
4/23/2019	8:58:19	769	68.7	59.1	0.2
4/23/2019	8:59:19	769	68.8	59	0.3
4/23/2019	9:00:19	764	68.9	59.2	0.3
4/23/2019	9:01:19	758	68.9	58.5	0.4
4/23/2019	9:02:19	753	68.8	56.9	0.3
4/23/2019	9:03:19	752	68.5	56.2	0.4
4/23/2019	9:04:19	749	68.1	55.8	0.3
4/23/2019	9:05:19	746	67.7	55	0.2
4/23/2019	9:06:19	741	67.2	55.1	0.2
4/23/2019	9:07:19	740	67	57.2	0.2
4/23/2019	9:08:19	736	66.9	59	0.1

4/23/2019	9:09:19	733	67.2	59.1	0.1
4/23/2019	9:10:19	730	67.4	58.7	0.1
4/23/2019	9:11:19	729	67.6	58.7	0.1
4/23/2019	9:12:19	728	67.8	59	0.1
4/23/2019	9:13:19	727	68	58.9	0
4/23/2019	9:14:19	727	68.2	58.9	0.1
4/23/2019	9:15:19	727	68.3	58.7	0.1
4/23/2019	9:16:19	726	68.5	58.6	0.1
4/23/2019	9:17:19	726	68.6	58.7	0
4/23/2019	9:18:19	724	68.6	58.4	0.1
4/23/2019	9:19:19	723	68.7	57.8	0.1
4/23/2019	9:20:19	723	68.8	57.6	0.1
4/23/2019	9:21:19	724	68.8	57.1	0
4/23/2019	9:22:19	717	68.8	56.7	0.1
4/23/2019	9:23:19	713	68.8	56.7	0.1
4/23/2019	9:24:19	710	68.8	56.6	0.1
4/23/2019	9:25:19	708	68.9	56.3	0.1
4/23/2019	9:26:19	708	68.9	56.5	0.1
4/23/2019	9:27:19	706	69	56.3	0
4/23/2019	9:28:19	705	69.1	56.4	0
4/23/2019	9:29:19	702	68.6	55.1	0
4/23/2019	9:30:19	700	68	54	0
4/23/2019	9:31:19	699	67.4	54.6	0
4/23/2019	9:32:19	694	67.3	57.2	0
4/23/2019	9:33:19	691	67.2	59.3	0
4/23/2019	9:34:19	690	67.3	59.2	0
4/23/2019	9:35:19	687	67.2	57.9	0
4/23/2019	9:36:19	687	67.5	58.6	0
4/23/2019	9:37:19	684	67.7	58.4	0
4/23/2019	9:38:19	685	67.9	58.1	0
4/23/2019	9:39:19	684	68.1	57.9	0
4/23/2019	9:40:19	683	68.2	57.5	0
4/23/2019	9:41:19	680	68.3	57.2	0
4/23/2019	9:42:19	680	68.5	57.4	0

4/23/2019	9:43:19	677	68.6	57.3	0
4/23/2019	9:44:19	677	68.7	57	0
4/23/2019	9:45:19	674	68.9	56.9	0
4/23/2019	9:46:19	673	69	56.8	0
4/23/2019	9:47:19	672	69.1	56.7	0
4/23/2019	9:48:19	669	69.2	56.3	0
4/23/2019	9:49:19	665	69.3	56.2	0
4/23/2019	9:50:19	667	69.1	55	0
4/23/2019	9:51:19	670	68.9	54.2	0
4/23/2019	9:52:19	670	68.7	54.3	0
4/23/2019	9:53:19	669	68.3	53.9	0
4/23/2019	9:54:19	671	67.5	53.1	0
4/23/2019	9:55:19	671	67	54	0
4/23/2019	9:56:19	671	67.1	56.7	0
4/23/2019	9:57:19	671	67.2	57.9	0
4/23/2019	9:58:19	679	67.7	56.9	0
4/23/2019	9:59:19	679	67.9	57.3	0
4/23/2019	10:00:19	678	68.2	57.3	0
4/23/2019	10:01:19	675	68.4	57.1	0
4/23/2019	10:02:19	668	68.6	57	0
4/23/2019	10:03:19	670	68.7	56.8	0
4/23/2019	10:04:19	671	68.9	56.5	0
4/23/2019	10:05:19	667	69	56.1	0
4/23/2019	10:06:19	669	69.1	56	0
4/23/2019	10:07:19	670	69.2	55.8	0
4/23/2019	10:08:19	671	69.3	55.8	0
4/23/2019	10:09:19	673	69.4	55.9	0
4/23/2019	10:10:19	697	69.5	55.7	0
4/23/2019	10:11:19	695	69.6	55.5	0
4/23/2019	10:12:19	689	69.8	55.4	0
4/23/2019	10:13:19	719	69.9	55.5	0
4/23/2019	10:14:19	708	69.9	55.3	0
4/23/2019	10:15:19	708	70	55.1	0
4/23/2019	10:16:19	701	70.1	55	0

4/23/2019	10:17:19	734	70.1	54.9	0
4/23/2019	10:18:19	740	70.2	54.9	0
4/23/2019	10:19:19	740	70.3	54.9	0
4/23/2019	10:20:19	723	70.3	54.9	0
4/23/2019	10:21:19	720	70.4	54.8	0
4/23/2019	10:22:19	704	70.4	54.8	0
4/23/2019	10:23:19	692	70.5	54.8	0
4/23/2019	10:24:19	692	70.5	54.8	0
4/23/2019	10:25:19	689	70.6	54.8	0
4/23/2019	10:26:19	687	70.6	54.9	0
4/23/2019	10:27:19	692	70.7	54.8	0
4/23/2019	10:28:19	715	70.6	55	0
4/23/2019	10:29:19	716	70.7	55.4	0
4/23/2019	10:30:19	717	70.8	55.8	0
4/23/2019	10:31:19	714	70.8	55.7	0
4/23/2019	10:32:19	714	70.9	55.7	0
4/23/2019	10:33:19	724	70.7	54.5	0
4/23/2019	10:34:19	739	70.5	54.1	0
4/23/2019	10:35:19	753	70.3	53.8	0
4/23/2019	10:36:19	761	70.2	53.8	0
4/23/2019	10:37:19	770	70.1	53.5	0
4/23/2019	10:38:19	778	70	53.2	0
4/23/2019	10:39:19	790	69.7	52.8	0
4/23/2019	10:40:19	802	69.1	52.6	0
4/23/2019	10:41:19	816	68.5	52.4	0
4/23/2019	10:42:19	853	68.2	54.1	0.1
4/23/2019	10:43:19	855	68.4	56.4	0.1
4/23/2019	10:44:19	848	68.4	57.3	0.1
4/23/2019	10:45:19	852	68.8	57	0.1
4/23/2019	10:46:19	856	69	56.7	0.1
4/23/2019	10:47:19	855	69.2	56.5	0
4/23/2019	10:48:19	851	69.5	56.5	0.2
4/23/2019	10:49:19	851	69.6	56.2	0.1
4/23/2019	10:50:19	848	69.8	55.8	0.1



4/23/2019	10:51:19	851	69.9	55.1	0.1
4/23/2019	10:52:19	849	69.9	54.5	0.3
4/23/2019	10:53:19	847	70	53.8	0.1
4/23/2019	10:54:19	837	69.6	51.9	0.2
4/23/2019	10:55:19	834	69.3	51.4	0
4/23/2019	10:56:19	832	69.3	52	0.1
4/23/2019	10:57:19	830	69.2	53.9	0
4/23/2019	10:58:19	825	69	55.2	0.1
4/23/2019	10:59:19	822	68.8	53.6	0.1
4/23/2019	11:00:19	820	68.8	53.3	0.1
4/23/2019	11:01:19	817	68.5	54.7	0.1
4/23/2019	11:02:19	813	68.5	56.2	0.1
4/23/2019	11:03:19	808	68.7	56.4	0
4/23/2019	11:04:19	808	68.7	55.1	0.1
4/23/2019	11:05:19	808	68.8	54.9	0
4/23/2019	11:06:19	809	68.9	55.1	0.1
4/23/2019	11:07:19	809	69.1	54.7	0
4/23/2019	11:08:19	810	69.3	54.6	0
4/23/2019	11:09:19	809	69.4	53.7	0
4/23/2019	11:10:19	814	69.5	52.8	0
4/23/2019	11:11:19	818	69.7	52.6	0
4/23/2019	11:12:19	815	69.8	52.6	0.1
4/23/2019	11:13:19	809	69.3	51.4	0
4/23/2019	11:14:19	807	69	51	0.1
4/23/2019	11:15:19	801	68.6	51.4	0
4/23/2019	11:16:19	799	68.4	54.1	0
4/23/2019	11:17:19	795	68.5	56.1	0
4/23/2019	11:18:19	793	68.7	56.1	0
4/23/2019	11:19:19	795	68.7	54.7	0
4/23/2019	11:20:19	792	68.7	54	0
4/23/2019	11:21:19	790	68.7	53.1	0
4/23/2019	11:22:19	788	68.5	52.7	0
4/23/2019	11:23:19	787	68.2	51.8	0
4/23/2019	11:24:19	790	67.9	51.8	0

4/23/2019	11:25:19	790	67.9	54	0
4/23/2019	11:26:19	790	68	55.4	0
4/23/2019	11:27:19	808	68.3	55.7	0
4/23/2019	11:28:19	865	68.6	56.1	0
4/23/2019	11:29:19	853	68.9	55.5	0
4/23/2019	11:30:19	838	69.1	55.2	0
4/23/2019	11:31:19	827	69.3	55.3	0
4/23/2019	11:32:19	823	69.5	54.9	0
4/23/2019	11:33:19	822	69.7	54.4	0
4/23/2019	11:34:19	820	69.8	53.1	0
4/23/2019	11:35:19	817	69.5	52.1	0
4/23/2019	11:36:19	813	69.3	50.9	0
4/23/2019	11:37:19	810	69.4	51.1	0
4/23/2019	11:38:19	809	69.2	53	0
4/23/2019	11:39:19	809	69	54.1	0
4/23/2019	11:40:19	809	68.9	53.6	0
4/23/2019	11:41:19	805	68.8	52.2	0
4/23/2019	11:42:19	803	68.8	53.4	0
4/23/2019	11:43:19	799	68.7	55.2	0
4/23/2019	11:44:19	795	68.8	54.9	0
4/23/2019	11:45:19	792	68.9	54.2	0
4/23/2019	11:46:19	788	68.9	53.2	0
4/23/2019	11:47:19	781	68.9	52.4	0
4/23/2019	11:48:19	773	68.8	51.9	0
4/23/2019	11:49:19	768	68.7	51.3	0
4/23/2019	11:50:19	760	68.7	51.1	0
4/23/2019	11:51:19	751	68.6	52.8	0
4/23/2019	11:52:19	746	68.4	54.2	0
4/23/2019	11:53:19	742	68.5	53.5	0
4/23/2019	11:54:19	738	68.4	52.5	0
4/23/2019	11:55:19	732	68.5	53.3	0
4/23/2019	11:56:19	726	68.4	54.8	0
4/23/2019	11:57:19	723	68.5	55.1	0
4/23/2019	11:58:19	720	68.5	54.3	0

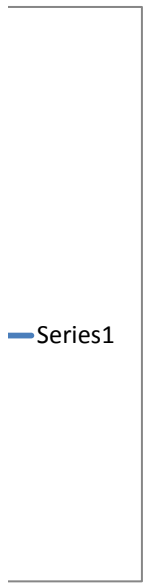
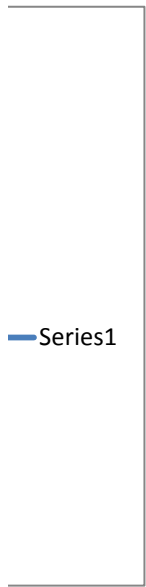
4/23/2019	11:59:19	717	68.6	53.6	0
4/23/2019	12:00:19	713	68.7	52.9	0
4/23/2019	12:01:19	707	68.7	52	0
4/23/2019	12:02:19	698	68.5	51.6	0
4/23/2019	12:03:19	687	68.5	51	0
4/23/2019	12:04:19	675	68.4	52.4	0
4/23/2019	12:05:19	660	68.2	54.5	0
4/23/2019	12:06:19	658	68.3	54.6	0
4/23/2019	12:07:19	654	68.2	53.6	0
4/23/2019	12:08:19	644	68.3	53	0
4/23/2019	12:09:19	637	68.3	54.2	0
4/23/2019	12:10:19	633	68.3	55.9	0
4/23/2019	12:11:19	629	68.4	55.6	0
4/23/2019	12:12:19	627	68.4	54.4	0
4/23/2019	12:13:19	628	68.5	53.7	0
4/23/2019	12:14:19	625	68.6	52.9	0
4/23/2019	12:15:19	624	68.4	52.3	0
4/23/2019	12:16:19	621	68.4	51.4	0
4/23/2019	12:17:19	616	68.4	51.1	0
4/23/2019	12:18:19	616	68.2	52.7	0
4/23/2019	12:19:19	611	68	54.2	0
4/23/2019	12:20:19	608	68.1	53.8	0
4/23/2019	12:21:19	608	68.1	52.8	0
4/23/2019	12:22:19	604	68.1	53	0
4/23/2019	12:23:19	599	68	54.8	0
4/23/2019	12:24:19	596	68.1	55.7	0
4/23/2019	12:25:19	595	68.2	54.7	0
4/23/2019	12:26:19	597	68.2	53.7	0
4/23/2019	12:27:19	596	68.3	53.2	0
4/23/2019	12:28:19	593	68.3	52.4	0
4/23/2019	12:29:19	594	68.2	52	0
4/23/2019	12:30:19	592	68.1	51.3	0
4/23/2019	12:31:19	588	68	51.4	0
4/23/2019	12:32:19	585	67.9	53.1	0

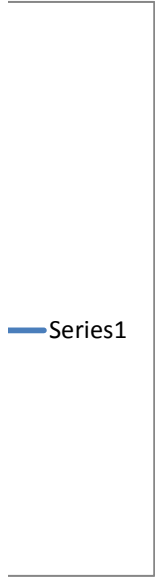
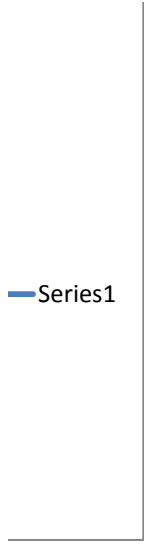
4/23/2019	12:33:19	582	67.9	54.3	0
4/23/2019	12:34:19	583	68	53.7	0
4/23/2019	12:35:19	580	68	52.5	0
4/23/2019	12:36:19	578	67.9	53.3	0
4/23/2019	12:37:19	578	67.9	54.7	0
4/23/2019	12:38:19	575	68	55.2	0
4/23/2019	12:39:19	574	68	54.3	0
4/23/2019	12:40:19	576	68.1	53.6	0
4/23/2019	12:41:19	576	68.1	52.7	0
4/23/2019	12:42:19	576	68.1	52.1	0
4/23/2019	12:43:19	577	68	51.8	0
4/23/2019	12:44:19	576	68	50.8	0
4/23/2019	12:45:19	577	67.9	51.6	0
4/23/2019	12:46:19	578	67.8	53.3	0
4/23/2019	12:47:19	579	67.8	53.8	0
4/23/2019	12:48:19	578	67.8	53	0
4/23/2019	12:49:19	581	67.8	52.2	0
4/23/2019	12:50:19	583	67.8	53.5	0
4/23/2019	12:51:19	586	67.8	54.9	0
4/23/2019	12:52:19	588	68	54.3	0
4/23/2019	12:53:19	591	68.1	53.6	0
4/23/2019	12:54:19	593	68.1	52.8	0
4/23/2019	12:55:19	592	68.1	52.1	0
4/23/2019	12:56:19	594	68.2	51.6	0
4/23/2019	12:57:19	596	68.2	51.4	0
4/23/2019	12:58:19	596	68.1	51	0
4/23/2019	12:59:19	598	68.1	50.4	0
4/23/2019	13:00:19	598	68	51.6	0
4/23/2019	13:01:19	600	67.9	53.3	0
4/23/2019	13:02:19	604	67.8	53.6	0
4/23/2019	13:03:19	610	67.7	52.2	0
4/23/2019	13:04:19	617	67.5	51.8	0
4/23/2019	13:05:19	619	67.8	53.2	0
4/23/2019	13:06:19	622	67.9	54.8	0

4/23/2019	13:07:19	643	68.1	54.8	0
4/23/2019	13:08:19	641	68.2	53.6	0
4/23/2019	13:09:19	671	68.4	53.8	0
4/23/2019	13:10:19	715	68.5	53.4	0
4/23/2019	13:11:19	686	68.5	52.9	0
4/23/2019	13:12:19	690	68.6	52.7	0
4/23/2019	13:13:19	692	68.6	52.2	0
4/23/2019	13:14:19	699	68.6	52.2	0
4/23/2019	13:15:19	731	68.5	52.1	0
4/23/2019	13:16:19	763	68.4	51.5	0
4/23/2019	13:17:19	746	68.4	52.2	0
4/23/2019	13:18:19	733	68.4	53.7	0
4/23/2019	13:19:19	729	68.4	55.1	0
4/23/2019	13:20:19	732	68.5	54.6	0
4/23/2019	13:21:19	733	68.5	53.6	0
4/23/2019	13:22:19	732	68.5	52.6	0
4/23/2019	13:23:19	739	68.4	52.4	0
4/23/2019	13:24:19	738	68.4	52	0
4/23/2019	13:25:19	741	68.2	51.5	0
4/23/2019	13:26:19	740	68	51.2	0
4/23/2019	13:27:19	744	67.9	51.1	0
4/23/2019	13:28:19	742	67.9	52.7	0
4/23/2019	13:29:19	740	68	54.5	0
4/23/2019	13:30:19	744	67.9	54	0
4/23/2019	13:31:19	744	68	52.9	0
4/23/2019	13:32:19	746	67.9	52.2	0
4/23/2019	13:33:19	746	67.9	52.1	0
4/23/2019	13:34:19	751	67.9	51.9	0
4/23/2019	13:35:19	754	67.9	51.3	0
4/23/2019	13:36:19	761	67.9	51	0
4/23/2019	13:37:19	759	67.9	50.9	0
4/23/2019	13:38:19	756	67.8	50.4	0
4/23/2019	13:39:19	749	67.9	50.6	0
4/23/2019	13:40:19	747	67.8	50.4	0

4/23/2019	13:41:19	743	67.8	50.2	0
4/23/2019	13:42:19	737	67.8	50.3	0
4/23/2019	13:43:19	733	67.6	49.7	0
4/23/2019	13:44:19	729	67.6	49.8	0
4/23/2019	13:45:19	725	67.5	49.7	0

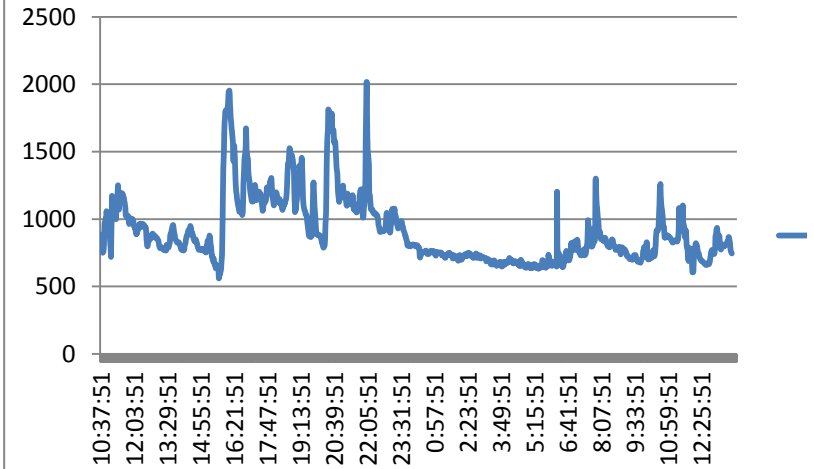




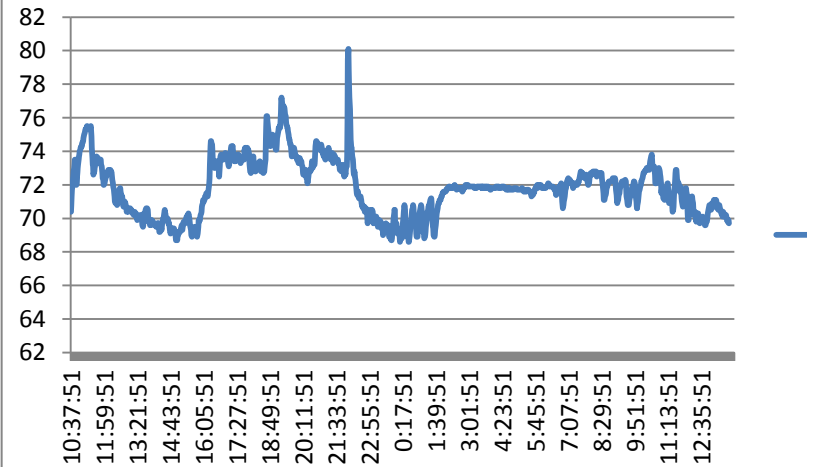


Date	Time	CO2	T	H	CO
Minutes		1628	1628	1628	1628
Minimum		561	68.6	38.1	0.4
Maximum		2017	80.1	59.1	6
Average		906.0215	71.89254	47.80081	1.914919
4/22/2019	10:37:51	884	70.4	57.5	1
4/22/2019	10:38:51	811	70.8	55.1	1
4/22/2019	10:39:51	805	71.3	54.1	0.9
4/22/2019	10:40:51	804	71.7	53.5	1
4/22/2019	10:41:51	774	72	52.8	0.9
4/22/2019	10:42:51	756	72.3	52.2	0.9
4/22/2019	10:43:51	750	72.5	52	0.9
4/22/2019	10:44:51	755	72.8	51.8	0.9
4/22/2019	10:45:51	774	73	51.5	0.9
4/22/2019	10:46:51	806	73.2	51.8	0.9
4/22/2019	10:47:51	908	73.5	51	0.9
4/22/2019	10:48:51	972	73.5	49.9	1
4/22/2019	10:49:51	985	73.2	49.1	1
4/22/2019	10:50:51	1000	72.7	48.4	1
4/22/2019	10:51:51	1008	72	47.9	0.9
4/22/2019	10:52:51	1012	72.5	49.5	0.9
4/22/2019	10:53:51	1059	72.7	49.5	0.9
4/22/2019	10:54:51	1021	73	49.3	0.9
4/22/2019	10:55:51	938	73.2	49.1	0.9
4/22/2019	10:56:51	951	73.5	48.8	0.9
4/22/2019	10:57:51	928	73.7	48.6	0.9
4/22/2019	10:58:51	916	73.8	48.5	0.9
4/22/2019	10:59:51	928	74	48.2	0.9
4/22/2019	11:00:51	954	74.1	48.5	0.9
4/22/2019	11:01:51	898	74.2	49	0.8
4/22/2019	11:02:51	842	74.2	48.9	0.9
4/22/2019	11:03:51	778	74.3	48.8	0.8
4/22/2019	11:04:51	719	74.3	48.1	0.8
4/22/2019	11:05:51	863	74.5	47.6	0.9

## Carbon Dioxide (CO2)

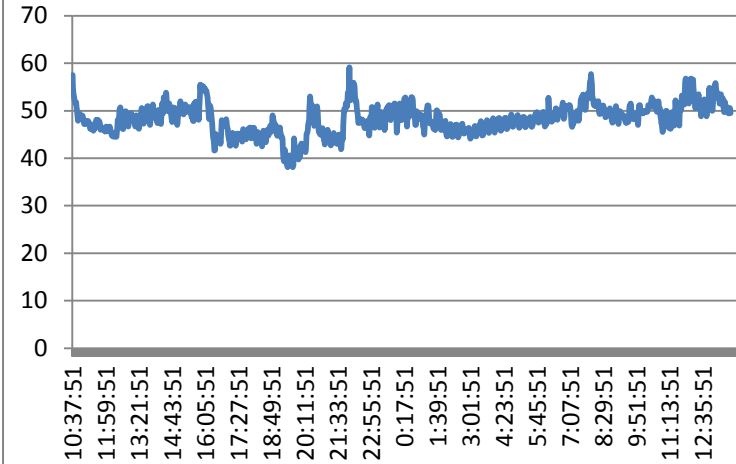


## Temperature (F)

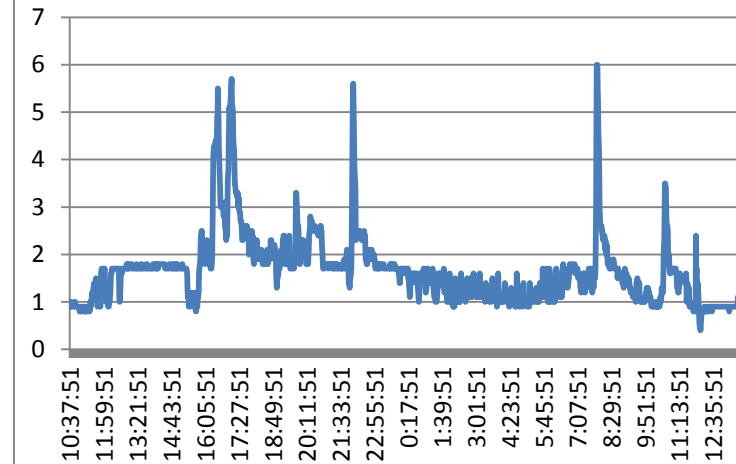


4/22/2019	11:06:51	994	74.5	47.2	0.9
4/22/2019	11:07:51	1172	74.6	47.6	0.9
4/22/2019	11:08:51	1075	74.8	47.3	0.9
4/22/2019	11:09:51	1085	74.9	47.8	0.8
4/22/2019	11:10:51	1051	75	47.5	0.9
4/22/2019	11:11:51	1058	75.1	47.3	0.9
4/22/2019	11:12:51	1156	75.2	47.8	0.8
4/22/2019	11:13:51	1090	75.3	47.7	0.8
4/22/2019	11:14:51	1074	75.3	47.5	0.9
4/22/2019	11:15:51	1088	75.4	47.8	0.8
4/22/2019	11:16:51	1006	75.4	47.8	0.8
4/22/2019	11:17:51	999	75.5	47.7	0.9
4/22/2019	11:18:51	1121	75.5	47.5	0.8
4/22/2019	11:19:51	1108	75.4	47.1	0.8
4/22/2019	11:20:51	1153	75.4	46.5	0.8
4/22/2019	11:21:51	1173	75.4	46.2	0.8
4/22/2019	11:22:51	1250	75.4	46.4	0.9
4/22/2019	11:23:51	1179	75.3	46.2	0.9
4/22/2019	11:24:51	1074	75.4	46.2	0.9
4/22/2019	11:25:51	1071	75.4	46.5	0.8
4/22/2019	11:26:51	1136	75.5	47.1	0.9
4/22/2019	11:27:51	1196	75.2	47	1
4/22/2019	11:28:51	1173	74.9	46.2	0.9
4/22/2019	11:29:51	1158	74.2	45.8	1
4/22/2019	11:30:51	1149	73.6	46	1.1
4/22/2019	11:31:51	1164	73.2	46.2	1.2
4/22/2019	11:32:51	1185	73.1	46.7	1.1
4/22/2019	11:33:51	1191	72.6	46.4	1.2
4/22/2019	11:34:51	1169	72.8	47.5	1.3
4/22/2019	11:35:51	1182	72.8	47.8	1.3
4/22/2019	11:36:51	1160	73	48.1	1.4
4/22/2019	11:37:51	1160	73.1	48	1.1
4/22/2019	11:38:51	1142	73.4	48.1	1.3
4/22/2019	11:39:51	1129	73.5	47.9	1.2

### Humidity (%)



### Carbon Monoxide (CO)



4/22/2019	11:40:51	1117	73.5	47.5	1.5
4/22/2019	11:41:51	1079	73.7	48	1.4
4/22/2019	11:42:51	1025	73.6	47.8	1.1
4/22/2019	11:43:51	1025	73.5	47.7	1.1
4/22/2019	11:44:51	1024	73.6	47.7	0.9
4/22/2019	11:45:51	1017	73.5	47	1
4/22/2019	11:46:51	1012	73.3	46	1.1
4/22/2019	11:47:51	1021	73.3	46.1	1.3
4/22/2019	11:48:51	1026	73.4	46.6	1.3
4/22/2019	11:49:51	1006	73.5	46.2	1
4/22/2019	11:50:51	981	73.5	46.1	0.9
4/22/2019	11:51:51	964	73.5	46.4	0.9
4/22/2019	11:52:51	984	73.2	46.2	1.4
4/22/2019	11:53:51	1009	73.1	45.9	1.6
4/22/2019	11:54:51	1007	72.9	45.9	1.7
4/22/2019	11:55:51	999	72.7	46.2	1.6
4/22/2019	11:56:51	1001	72.4	46.1	1.6
4/22/2019	11:57:51	1002	72.3	45.8	1.7
4/22/2019	11:58:51	999	72	45.6	1.7
4/22/2019	11:59:51	997	72	46	1.7
4/22/2019	12:00:51	1000	72.1	46.7	1.6
4/22/2019	12:01:51	994	72.2	46.4	1.7
4/22/2019	12:02:51	980	72.3	46.1	1.5
4/22/2019	12:03:51	952	72.4	45.9	1.3
4/22/2019	12:04:51	949	72.5	45.7	1
4/22/2019	12:05:51	940	72.6	45.7	1.1
4/22/2019	12:06:51	931	72.6	45.8	1.2
4/22/2019	12:07:51	941	72.7	46.4	1.4
4/22/2019	12:08:51	913	72.8	46.3	1.3
4/22/2019	12:09:51	887	72.8	46.7	1
4/22/2019	12:10:51	896	72.9	46.5	0.9
4/22/2019	12:11:51	893	72.9	46.1	0.9
4/22/2019	12:12:51	908	72.8	45.4	1
4/22/2019	12:13:51	916	72.9	45.1	1

4/22/2019	12:14:51	920	72.9	45	1
4/22/2019	12:15:51	927	72.9	44.7	1.2
4/22/2019	12:16:51	940	72.7	44.7	1.4
4/22/2019	12:17:51	958	72.8	44.9	1.6
4/22/2019	12:18:51	952	72.7	44.8	1.6
4/22/2019	12:19:51	965	72.3	44.5	1.7
4/22/2019	12:20:51	966	72.2	44.6	1.7
4/22/2019	12:21:51	963	72.1	44.8	1.7
4/22/2019	12:22:51	947	71.9	45.3	1.7
4/22/2019	12:23:51	943	71.7	45.4	1.7
4/22/2019	12:24:51	944	71.5	45.1	1.7
4/22/2019	12:25:51	947	71.3	44.5	1.7
4/22/2019	12:26:51	953	71	44.5	1.7
4/22/2019	12:27:51	963	70.9	45.9	1.7
4/22/2019	12:28:51	959	70.9	46.8	1.7
4/22/2019	12:29:51	957	70.9	48.1	1.7
4/22/2019	12:30:51	951	70.9	48.1	1.7
4/22/2019	12:31:51	943	70.8	47.6	1.7
4/22/2019	12:32:51	941	70.9	48.3	1.7
4/22/2019	12:33:51	940	70.9	49.7	1.7
4/22/2019	12:34:51	934	71.1	50.4	1.7
4/22/2019	12:35:51	904	71.3	50.7	1.7
4/22/2019	12:36:51	849	71.5	50.5	1.5
4/22/2019	12:37:51	803	71.7	49.8	1.1
4/22/2019	12:38:51	798	71.8	48.8	1
4/22/2019	12:39:51	804	71.8	47.9	1.2
4/22/2019	12:40:51	821	71.6	47	1.4
4/22/2019	12:41:51	831	71.5	46.2	1.6
4/22/2019	12:42:51	842	71.3	46.1	1.7
4/22/2019	12:43:51	847	71.2	47.1	1.6
4/22/2019	12:44:51	856	71.3	48.4	1.7
4/22/2019	12:45:51	860	71.1	48.4	1.7
4/22/2019	12:46:51	860	70.9	47.8	1.7
4/22/2019	12:47:51	857	70.7	47.9	1.7



4/22/2019	12:48:51	876	70.9	49.4	1.7
4/22/2019	12:49:51	881	71	49.9	1.7
4/22/2019	12:50:51	888	71	49.4	1.7
4/22/2019	12:51:51	891	70.9	49	1.7
4/22/2019	12:52:51	890	70.9	48.6	1.7
4/22/2019	12:53:51	884	70.8	48.2	1.7
4/22/2019	12:54:51	879	70.7	47.4	1.7
4/22/2019	12:55:51	877	70.4	46.7	1.8
4/22/2019	12:56:51	874	70.5	47.2	1.7
4/22/2019	12:57:51	876	70.6	48.3	1.7
4/22/2019	12:58:51	874	70.6	48.5	1.8
4/22/2019	12:59:51	865	70.4	47.9	1.7
4/22/2019	13:00:51	859	70.4	48.1	1.7
4/22/2019	13:01:51	859	70.5	48.9	1.7
4/22/2019	13:02:51	861	70.6	49.5	1.7
4/22/2019	13:03:51	857	70.6	49.2	1.8
4/22/2019	13:04:51	850	70.6	49.2	1.8
4/22/2019	13:05:51	845	70.5	48.4	1.8
4/22/2019	13:06:51	840	70.5	48.1	1.8
4/22/2019	13:07:51	826	70.5	47.8	1.8
4/22/2019	13:08:51	809	70.4	47.9	1.7
4/22/2019	13:09:51	797	70.4	47.7	1.7
4/22/2019	13:10:51	786	70.3	47.7	1.7
4/22/2019	13:11:51	783	70.3	47.2	1.7
4/22/2019	13:12:51	787	70.2	46.7	1.7
4/22/2019	13:13:51	788	70.3	46.8	1.7
4/22/2019	13:14:51	790	70.4	48.2	1.7
4/22/2019	13:15:51	791	70.4	49	1.7
4/22/2019	13:16:51	787	70.3	48.3	1.7
4/22/2019	13:17:51	781	70.3	48.4	1.7
4/22/2019	13:18:51	779	70.3	47.9	1.7
4/22/2019	13:19:51	775	70.1	47.5	1.8
4/22/2019	13:20:51	772	70	47.1	1.7
4/22/2019	13:21:51	773	69.9	46.2	1.7

4/22/2019	13:22:51	772	70	46.4	1.7
4/22/2019	13:23:51	770	70.1	47.4	1.7
4/22/2019	13:24:51	770	70.1	48.1	1.7
4/22/2019	13:25:51	767	70	47.6	1.7
4/22/2019	13:26:51	766	70	47.3	1.7
4/22/2019	13:27:51	789	70.1	49.7	1.7
4/22/2019	13:28:51	810	70.2	50.6	1.7
4/22/2019	13:29:51	798	70.2	49.5	1.7
4/22/2019	13:30:51	790	70.2	49.3	1.8
4/22/2019	13:31:51	787	70.1	48.8	1.8
4/22/2019	13:32:51	789	70.1	48.2	1.7
4/22/2019	13:33:51	789	69.8	47.3	1.7
4/22/2019	13:34:51	810	69.6	47.5	1.7
4/22/2019	13:35:51	816	69.5	47.9	1.7
4/22/2019	13:36:51	827	69.6	48.3	1.7
4/22/2019	13:37:51	878	70.1	49.6	1.7
4/22/2019	13:38:51	893	70.3	49.3	1.7
4/22/2019	13:39:51	888	70.1	48	1.7
4/22/2019	13:40:51	911	70.2	47.9	1.7
4/22/2019	13:41:51	924	70.3	49.1	1.7
4/22/2019	13:42:51	936	70.5	50.9	1.8
4/22/2019	13:43:51	951	70.6	51	1.8
4/22/2019	13:44:51	956	70.6	50.1	1.8
4/22/2019	13:45:51	941	70.6	49.9	1.7
4/22/2019	13:46:51	926	70.6	49.3	1.7
4/22/2019	13:47:51	904	70.5	48.6	1.7
4/22/2019	13:48:51	883	70.2	47.4	1.7
4/22/2019	13:49:51	865	69.8	47	1.7
4/22/2019	13:50:51	855	69.8	48.2	1.7
4/22/2019	13:51:51	848	69.9	49.7	1.7
4/22/2019	13:52:51	841	69.8	49.6	1.7
4/22/2019	13:53:51	834	69.6	48.7	1.7
4/22/2019	13:54:51	829	69.7	49	1.7
4/22/2019	13:55:51	827	69.6	50.7	1.7

4/22/2019	13:56:51	825	69.8	51.3	1.7
4/22/2019	13:57:51	823	69.9	50.6	1.7
4/22/2019	13:58:51	824	69.8	50.2	1.8
4/22/2019	13:59:51	828	69.8	49.3	1.8
4/22/2019	14:00:51	821	69.8	49.1	1.8
4/22/2019	14:01:51	816	69.7	48.5	1.8
4/22/2019	14:02:51	805	69.7	48.6	1.8
4/22/2019	14:03:51	797	69.7	48.4	1.7
4/22/2019	14:04:51	786	69.6	48.3	1.7
4/22/2019	14:05:51	776	69.6	48.5	1.7
4/22/2019	14:06:51	773	69.6	48	1.8
4/22/2019	14:07:51	773	69.6	47.4	1.8
4/22/2019	14:08:51	770	69.5	47.8	1.7
4/22/2019	14:09:51	769	69.5	49.5	1.8
4/22/2019	14:10:51	768	69.7	50.2	1.7
4/22/2019	14:11:51	767	69.7	49.4	1.7
4/22/2019	14:12:51	769	69.7	49	1.8
4/22/2019	14:13:51	771	69.6	48.6	1.8
4/22/2019	14:14:51	803	69.7	48.9	1.8
4/22/2019	14:15:51	809	69.4	47.6	1.8
4/22/2019	14:16:51	823	69.2	47.2	1.8
4/22/2019	14:17:51	846	69.2	49.2	1.8
4/22/2019	14:18:51	856	69.5	51.1	1.8
4/22/2019	14:19:51	871	69.6	51.5	1.8
4/22/2019	14:20:51	878	69.5	49.7	1.8
4/22/2019	14:21:51	882	69.3	49.5	1.8
4/22/2019	14:22:51	899	69.5	51.3	1.8
4/22/2019	14:23:51	908	69.7	52.9	1.8
4/22/2019	14:24:51	919	69.9	52	1.8
4/22/2019	14:25:51	908	70	51.4	1.8
4/22/2019	14:26:51	895	70	51.1	1.8
4/22/2019	14:27:51	885	70.1	51.1	1.8
4/22/2019	14:28:51	904	70.4	53.8	1.7
4/22/2019	14:29:51	949	70.5	53.5	1.7

4/22/2019	14:30:51	929	70.3	52.2	1.7
4/22/2019	14:31:51	893	70.3	51.4	1.7
4/22/2019	14:32:51	906	69.9	50.2	1.7
4/22/2019	14:33:51	903	69.9	49.9	1.7
4/22/2019	14:34:51	892	69.9	50.4	1.7
4/22/2019	14:35:51	882	70	51.3	1.7
4/22/2019	14:36:51	866	70	51.5	1.7
4/22/2019	14:37:51	856	69.8	50.8	1.7
4/22/2019	14:38:51	847	69.7	50.4	1.7
4/22/2019	14:39:51	840	69.8	50	1.8
4/22/2019	14:40:51	837	69.6	49.5	1.8
4/22/2019	14:41:51	831	69.5	49.1	1.8
4/22/2019	14:42:51	838	69.3	48.5	1.8
4/22/2019	14:43:51	850	69.1	47.6	1.7
4/22/2019	14:44:51	832	69.2	48.8	1.7
4/22/2019	14:45:51	824	69.4	49.8	1.7
4/22/2019	14:46:51	818	69.4	50.7	1.7
4/22/2019	14:47:51	804	69.4	50.3	1.8
4/22/2019	14:48:51	794	69.2	50.3	1.7
4/22/2019	14:49:51	781	69.3	50.4	1.7
4/22/2019	14:50:51	773	69.4	50.6	1.7
4/22/2019	14:51:51	770	69.4	50.5	1.7
4/22/2019	14:52:51	773	69.4	50	1.8
4/22/2019	14:53:51	774	69.3	49.3	1.8
4/22/2019	14:54:51	774	69.2	48.9	1.7
4/22/2019	14:55:51	773	69.2	48.1	1.7
4/22/2019	14:56:51	775	68.9	47	1.7
4/22/2019	14:57:51	774	68.7	47.4	1.8
4/22/2019	14:58:51	775	68.9	48.5	1.7
4/22/2019	14:59:51	772	68.9	50.5	1.7
4/22/2019	15:00:51	773	68.7	49.5	1.7
4/22/2019	15:01:51	772	68.9	49.2	1.7
4/22/2019	15:02:51	776	69	49.5	1.7
4/22/2019	15:03:51	776	69.1	51.3	1.7

4/22/2019	15:04:51	775	69.2	52	1.7
4/22/2019	15:05:51	765	69.2	51.3	1.7
4/22/2019	15:06:51	759	69.2	51.2	1.7
4/22/2019	15:07:51	757	69.2	50.9	1.7
4/22/2019	15:08:51	758	69.3	50.7	1.7
4/22/2019	15:09:51	751	69.3	50.4	1.8
4/22/2019	15:10:51	764	69.5	50.9	1.8
4/22/2019	15:11:51	804	69.6	51.2	1.7
4/22/2019	15:12:51	792	69.3	49.2	1.7
4/22/2019	15:13:51	839	69.3	49.9	1.7
4/22/2019	15:14:51	819	69.6	50.8	1.7
4/22/2019	15:15:51	812	69.7	51.3	1.7
4/22/2019	15:16:51	841	69.8	51.3	1.7
4/22/2019	15:17:51	856	69.8	50.9	1.7
4/22/2019	15:18:51	878	69.8	50.6	1.7
4/22/2019	15:19:51	866	69.7	50.2	1.7
4/22/2019	15:20:51	850	69.7	50.1	1.7
4/22/2019	15:21:51	822	69.9	50.1	1.6
4/22/2019	15:22:51	787	69.9	49.8	1.3
4/22/2019	15:23:51	753	70.1	50.1	1.1
4/22/2019	15:24:51	724	70	50.1	1.1
4/22/2019	15:25:51	731	70.1	50.5	0.9
4/22/2019	15:26:51	718	70.2	50.7	0.9
4/22/2019	15:27:51	689	70.2	50.8	0.9
4/22/2019	15:28:51	710	70.3	50.5	0.9
4/22/2019	15:29:51	705	70.1	49.7	1
4/22/2019	15:30:51	680	70	49.2	1.1
4/22/2019	15:31:51	663	69.8	49.1	1.1
4/22/2019	15:32:51	662	69.6	48.6	1.1
4/22/2019	15:33:51	669	69.4	48.6	1.2
4/22/2019	15:34:51	635	69.3	48.8	1
4/22/2019	15:35:51	647	69	47.9	1.1
4/22/2019	15:36:51	657	68.9	47.8	1.1
4/22/2019	15:37:51	658	69.1	49.3	1

4/22/2019	15:38:51	631	69.2	51.6	0.9
4/22/2019	15:39:51	640	69.1	50.7	1.1
4/22/2019	15:40:51	643	69.1	49.8	1.2
4/22/2019	15:41:51	618	69.1	50.7	0.9
4/22/2019	15:42:51	561	69.2	51.9	0.8
4/22/2019	15:43:51	563	69.5	51.6	0.8
4/22/2019	15:44:51	598	69.5	50.6	0.9
4/22/2019	15:45:51	592	69.4	50.4	0.9
4/22/2019	15:46:51	606	69.5	50	0.9
4/22/2019	15:47:51	616	69.4	49.6	1.1
4/22/2019	15:48:51	628	69.3	49.3	1.1
4/22/2019	15:49:51	668	68.9	48.1	1.2
4/22/2019	15:50:51	737	69	48.5	1.6
4/22/2019	15:51:51	874	69.1	50.7	1.7
4/22/2019	15:52:51	1035	69.5	53.3	1.8
4/22/2019	15:53:51	1230	69.9	55.5	1.9
4/22/2019	15:54:51	1381	69.8	54.6	2.2
4/22/2019	15:55:51	1509	69.9	54.9	2.4
4/22/2019	15:56:51	1646	69.9	55.1	2.5
4/22/2019	15:57:51	1716	70.1	55.3	2.5
4/22/2019	15:58:51	1743	70.2	55	2.3
4/22/2019	15:59:51	1796	70.3	54.7	2.3
4/22/2019	16:00:51	1806	70.4	54.4	2.3
4/22/2019	16:01:51	1801	70.7	55.1	2.2
4/22/2019	16:02:51	1806	70.8	54.7	1.9
4/22/2019	16:03:51	1798	70.9	54.6	2
4/22/2019	16:04:51	1825	71.1	54.5	1.8
4/22/2019	16:05:51	1823	71.1	54.6	1.9
4/22/2019	16:06:51	1864	71	54	2
4/22/2019	16:07:51	1919	71.1	54.2	2.1
4/22/2019	16:08:51	1948	71.2	54.2	2.1
4/22/2019	16:09:51	1954	71.3	53.8	2.3
4/22/2019	16:10:51	1925	71.3	53.4	2.1
4/22/2019	16:11:51	1845	71.4	52.7	1.9



4/22/2019	16:12:51	1803	71.5	51.5	1.9
4/22/2019	16:13:51	1756	71.5	50.7	1.9
4/22/2019	16:14:51	1701	71.3	48.4	1.8
4/22/2019	16:15:51	1666	71.3	48.2	1.8
4/22/2019	16:16:51	1655	71.4	50.3	1.8
4/22/2019	16:17:51	1623	71.6	51.1	1.8
4/22/2019	16:18:51	1569	71.9	50.8	1.7
4/22/2019	16:19:51	1457	72.1	50.3	1.7
4/22/2019	16:20:51	1429	72.4	49.7	1.7
4/22/2019	16:21:51	1504	73.2	48.8	1.8
4/22/2019	16:22:51	1544	74.3	47.5	1.9
4/22/2019	16:23:51	1459	74.6	46.4	2.9
4/22/2019	16:24:51	1377	74.6	45.3	3.7
4/22/2019	16:25:51	1299	74.5	44.4	4.1
4/22/2019	16:26:51	1247	74.4	43.7	4.2
4/22/2019	16:27:51	1213	74	42.8	4.3
4/22/2019	16:28:51	1174	73.6	41.6	4.1
4/22/2019	16:29:51	1146	73.2	41.7	4.3
4/22/2019	16:30:51	1134	73.1	44.1	4.4
4/22/2019	16:31:51	1121	73.2	45.1	4.4
4/22/2019	16:32:51	1103	73	44.1	4.3
4/22/2019	16:33:51	1085	73	43.6	4.3
4/22/2019	16:34:51	1070	73.1	43.9	4.9
4/22/2019	16:35:51	1053	73.2	44.1	4.9
4/22/2019	16:36:51	1053	73.3	43.9	5.5
4/22/2019	16:37:51	1057	73.4	44.1	4.9
4/22/2019	16:38:51	1064	73.4	44	4.3
4/22/2019	16:39:51	1075	73.4	44.1	4.1
4/22/2019	16:40:51	1075	73.3	43.9	3.6
4/22/2019	16:41:51	1065	73.2	44.1	3.4
4/22/2019	16:42:51	1030	73.1	43.9	3.1
4/22/2019	16:43:51	1038	72.8	43	3
4/22/2019	16:44:51	1058	72.5	43.4	3
4/22/2019	16:45:51	1151	73.1	46.3	3.1

4/22/2019	16:46:51	1268	73.5	48	3
4/22/2019	16:47:51	1369	73.7	47.6	3
4/22/2019	16:48:51	1442	73.8	47.4	3
4/22/2019	16:49:51	1467	73.7	47	2.9
4/22/2019	16:50:51	1468	73.5	46.7	2.8
4/22/2019	16:51:51	1541	73.5	47	2.9
4/22/2019	16:52:51	1672	73.6	47.6	3.1
4/22/2019	16:53:51	1590	73.6	47	2.6
4/22/2019	16:54:51	1477	73.5	46.8	2.5
4/22/2019	16:55:51	1480	73.6	47.3	2.5
4/22/2019	16:56:51	1448	73.6	47.8	2.3
4/22/2019	16:57:51	1446	73.8	48.2	2.4
4/22/2019	16:58:51	1361	73.8	47.8	2.4
4/22/2019	16:59:51	1326	73.9	47	3
4/22/2019	17:00:51	1310	73.8	46.3	3.6
4/22/2019	17:01:51	1277	73.8	46.1	3.8
4/22/2019	17:02:51	1233	73.7	45	4.4
4/22/2019	17:03:51	1210	73.6	44.6	4.8
4/22/2019	17:04:51	1192	73.5	44	5.1
4/22/2019	17:05:51	1165	73.5	44	4.9
4/22/2019	17:06:51	1147	73.3	42.7	5.2
4/22/2019	17:07:51	1133	73.1	42.6	5.3
4/22/2019	17:08:51	1132	73.2	43.7	5.6
4/22/2019	17:09:51	1130	73.3	44.8	5.7
4/22/2019	17:10:51	1129	73.6	44.8	5.2
4/22/2019	17:11:51	1155	73.8	45.2	5.1
4/22/2019	17:12:51	1220	74	45.1	5
4/22/2019	17:13:51	1246	74.2	45.3	4.5
4/22/2019	17:14:51	1245	74.3	45.1	4.3
4/22/2019	17:15:51	1254	74.3	44.5	4.2
4/22/2019	17:16:51	1242	74.3	44.8	3.8
4/22/2019	17:17:51	1204	74.3	44.7	3.5
4/22/2019	17:18:51	1159	74.1	44.1	3.4
4/22/2019	17:19:51	1139	73.7	43.3	3.3

4/22/2019	17:20:51	1148	73.7	42.8	3.3
4/22/2019	17:21:51	1164	73.4	42.6	3.3
4/22/2019	17:22:51	1186	73.4	44.5	3.3
4/22/2019	17:23:51	1192	73.5	45.2	3.2
4/22/2019	17:24:51	1191	73.4	44.6	3.3
4/22/2019	17:25:51	1190	73.4	44.4	3
4/22/2019	17:26:51	1203	73.5	45	3.2
4/22/2019	17:27:51	1194	73.6	45	3
4/22/2019	17:28:51	1185	73.7	45.2	2.9
4/22/2019	17:29:51	1188	73.8	45	2.9
4/22/2019	17:30:51	1184	73.8	44.6	2.8
4/22/2019	17:31:51	1164	73.8	44.5	2.7
4/22/2019	17:32:51	1152	73.7	44.3	2.7
4/22/2019	17:33:51	1122	73.7	44.4	2.6
4/22/2019	17:34:51	1085	73.7	44.4	2.5
4/22/2019	17:35:51	1061	73.6	44.4	2.3
4/22/2019	17:36:51	1065	73.5	43.6	2.3
4/22/2019	17:37:51	1097	73.3	43.5	2.5
4/22/2019	17:38:51	1123	73.4	45.5	2.5
4/22/2019	17:39:51	1125	73.5	46.1	2.5
4/22/2019	17:40:51	1149	73.6	45.9	2.6
4/22/2019	17:41:51	1148	73.6	45.4	2.6
4/22/2019	17:42:51	1128	73.5	44.9	2.5
4/22/2019	17:43:51	1137	73.5	44.3	2.5
4/22/2019	17:44:51	1157	73.5	44.2	2.6
4/22/2019	17:45:51	1162	73.5	44.1	2.5
4/22/2019	17:46:51	1235	74.1	44	2.6
4/22/2019	17:47:51	1186	74	44.1	2.5
4/22/2019	17:48:51	1203	74.2	44.9	2.5
4/22/2019	17:49:51	1221	74.2	45.2	2.4
4/22/2019	17:50:51	1231	74.1	45.1	2.3
4/22/2019	17:51:51	1242	74.1	46	2
4/22/2019	17:52:51	1211	74.2	46.2	2
4/22/2019	17:53:51	1246	74.2	46.1	2.2

4/22/2019	17:54:51	1279	74.1	45.9	2.3
4/22/2019	17:55:51	1274	74.1	46.1	2.3
4/22/2019	17:56:51	1271	74.1	46.5	2.3
4/22/2019	17:57:51	1305	73.9	45.9	2.5
4/22/2019	17:58:51	1275	73.6	45.2	2.5
4/22/2019	17:59:51	1221	73.2	44.2	2.3
4/22/2019	18:00:51	1196	72.8	44.7	2.4
4/22/2019	18:01:51	1165	72.8	45.4	2.2
4/22/2019	18:02:51	1133	72.7	45.8	1.9
4/22/2019	18:03:51	1115	72.8	46.3	1.8
4/22/2019	18:04:51	1100	72.9	46.3	1.9
4/22/2019	18:05:51	1116	73.1	46.2	2
4/22/2019	18:06:51	1145	73.5	46.4	2
4/22/2019	18:07:51	1143	73.7	46	1.9
4/22/2019	18:08:51	1150	73.7	45.2	1.9
4/22/2019	18:09:51	1172	73.2	44.2	2.2
4/22/2019	18:10:51	1199	72.9	44.6	2.3
4/22/2019	18:11:51	1188	73	44.2	2
4/22/2019	18:12:51	1160	72.9	43	1.9
4/22/2019	18:13:51	1151	72.8	43.3	1.9
4/22/2019	18:14:51	1156	72.8	44.8	2
4/22/2019	18:15:51	1149	72.9	45.5	2
4/22/2019	18:16:51	1143	73	44.9	2
4/22/2019	18:17:51	1123	73	45.2	1.9
4/22/2019	18:18:51	1148	73.2	45	2.1
4/22/2019	18:19:51	1148	73.3	44.8	2.1
4/22/2019	18:20:51	1124	73.2	44.5	1.9
4/22/2019	18:21:51	1114	73.3	44.6	2.1
4/22/2019	18:22:51	1108	73.3	44.4	1.9
4/22/2019	18:23:51	1111	73.3	44.1	2
4/22/2019	18:24:51	1101	73.4	44.1	1.8
4/22/2019	18:25:51	1080	73.3	43.9	1.8
4/22/2019	18:26:51	1069	73	42.5	1.8
4/22/2019	18:27:51	1081	72.8	43.4	1.8

4/22/2019	18:28:51	1098	72.9	45.2	1.9
4/22/2019	18:29:51	1098	73	45.8	1.8
4/22/2019	18:30:51	1098	73	44.6	1.8
4/22/2019	18:31:51	1112	72.9	44.5	1.9
4/22/2019	18:32:51	1122	72.8	44.6	1.8
4/22/2019	18:33:51	1119	72.7	44.2	2
4/22/2019	18:34:51	1137	72.8	43.9	2
4/22/2019	18:35:51	1147	72.8	43.4	2.1
4/22/2019	18:36:51	1165	73	44.4	1.9
4/22/2019	18:37:51	1197	73.2	44.7	1.8
4/22/2019	18:38:51	1239	73.5	45.6	1.9
4/22/2019	18:39:51	1314	74.7	46	2
4/22/2019	18:40:51	1400	75.5	45.6	2.1
4/22/2019	18:41:51	1415	76.1	44.7	2
4/22/2019	18:42:51	1409	76.1	44.9	1.9
4/22/2019	18:43:51	1453	75.8	45.4	2.1
4/22/2019	18:44:51	1525	75.6	46	2.3
4/22/2019	18:45:51	1516	75.4	46.4	2.3
4/22/2019	18:46:51	1495	75.1	46.9	2.1
4/22/2019	18:47:51	1460	74.8	46.1	2.1
4/22/2019	18:48:51	1448	74.6	46	2.2
4/22/2019	18:49:51	1436	74.4	45.5	2
4/22/2019	18:50:51	1475	74.3	45.7	2.2
4/22/2019	18:51:51	1463	74.6	48.3	2.2
4/22/2019	18:52:51	1451	74.8	49	2.2
4/22/2019	18:53:51	1440	74.8	48.1	2.2
4/22/2019	18:54:51	1384	74.9	48	1.9
4/22/2019	18:55:51	1397	75	47.6	2
4/22/2019	18:56:51	1326	75	46.8	2.1
4/22/2019	18:57:51	1193	74.8	46.9	1.6
4/22/2019	18:58:51	1052	74.7	46.7	1.3
4/22/2019	18:59:51	1079	74.6	47.1	1.5
4/22/2019	19:00:51	1063	74.5	46.7	1.5
4/22/2019	19:01:51	1076	74.3	46.1	1.5

4/22/2019	19:02:51	1114	74.3	45.7	1.6
4/22/2019	19:03:51	1147	74.2	44.8	1.7
4/22/2019	19:04:51	1183	74.1	44.7	1.7
4/22/2019	19:05:51	1227	74.1	45.7	1.7
4/22/2019	19:06:51	1256	74.4	46.5	1.8
4/22/2019	19:07:51	1306	74.8	45.2	1.8
4/22/2019	19:08:51	1302	74.9	45.1	1.8
4/22/2019	19:09:51	1300	75.1	45.9	1.8
4/22/2019	19:10:51	1326	75.2	46.5	1.8
4/22/2019	19:11:51	1397	75.4	45.6	2.1
4/22/2019	19:12:51	1392	75.4	45	2.1
4/22/2019	19:13:51	1368	75.5	44.4	2.3
4/22/2019	19:14:51	1347	75.4	44.3	2.2
4/22/2019	19:15:51	1413	75.5	44.6	2.4
4/22/2019	19:16:51	1455	76.3	44.1	2.4
4/22/2019	19:17:51	1342	77.1	42.1	2.3
4/22/2019	19:18:51	1251	77.2	40.8	2.2
4/22/2019	19:19:51	1156	77	39.9	1.8
4/22/2019	19:20:51	1123	76.7	39.3	2
4/22/2019	19:21:51	1097	76.6	40.9	2
4/22/2019	19:22:51	1073	76.7	41.8	1.8
4/22/2019	19:23:51	1064	76.7	41.4	1.9
4/22/2019	19:24:51	1061	76.6	40.2	2
4/22/2019	19:25:51	1053	76.6	39.7	2.1
4/22/2019	19:26:51	1037	76.4	39.5	1.9
4/22/2019	19:27:51	1029	76.2	39.3	2
4/22/2019	19:28:51	1029	76.1	38.4	2.2
4/22/2019	19:29:51	1014	75.8	38.1	2.4
4/22/2019	19:30:51	984	75.6	39.2	1.9
4/22/2019	19:31:51	948	75.5	39.8	1.7
4/22/2019	19:32:51	925	75.4	40	1.7
4/22/2019	19:33:51	908	75.4	40.4	1.7
4/22/2019	19:34:51	886	75.2	40.6	1.7
4/22/2019	19:35:51	874	75	40.2	1.7



4/22/2019	19:36:51	877	74.8	39.9	1.7
4/22/2019	19:37:51	873	74.7	40.1	1.7
4/22/2019	19:38:51	869	74.7	40.2	1.7
4/22/2019	19:39:51	865	74.4	39.8	1.7
4/22/2019	19:40:51	869	74.4	39.9	1.7
4/22/2019	19:41:51	874	74.4	39	1.8
4/22/2019	19:42:51	879	74.1	38.1	1.8
4/22/2019	19:43:51	930	73.7	38.5	1.9
4/22/2019	19:44:51	1043	73.9	41.2	2.5
4/22/2019	19:45:51	1253	74.1	44.2	3.3
4/22/2019	19:46:51	1272	74.1	42.5	3.3
4/22/2019	19:47:51	1212	74.1	42.1	3
4/22/2019	19:48:51	1158	74.2	42.4	2.8
4/22/2019	19:49:51	1092	74.2	42.3	2.6
4/22/2019	19:50:51	1036	74	41.4	2.6
4/22/2019	19:51:51	989	73.9	41.9	2.5
4/22/2019	19:52:51	946	73.8	41.8	2.1
4/22/2019	19:53:51	914	73.7	41.5	2
4/22/2019	19:54:51	889	73.7	41.8	1.8
4/22/2019	19:55:51	888	73.7	40.2	2
4/22/2019	19:56:51	886	73.5	39.7	2
4/22/2019	19:57:51	886	73.6	40.6	2.1
4/22/2019	19:58:51	886	73.6	41.8	2.1
4/22/2019	19:59:51	879	73.6	41.6	2.2
4/22/2019	20:00:51	878	73.3	40.3	2.3
4/22/2019	20:01:51	876	73.4	41.3	2.2
4/22/2019	20:02:51	881	73.5	42.5	2.2
4/22/2019	20:03:51	878	73.6	43.1	2.3
4/22/2019	20:04:51	871	73.4	41.9	2.2
4/22/2019	20:05:51	863	73.3	41.8	2.1
4/22/2019	20:06:51	849	73.4	42	2
4/22/2019	20:07:51	839	73.4	41.7	2
4/22/2019	20:08:51	826	73.2	41.5	2
4/22/2019	20:09:51	815	73.1	41.5	1.9

4/22/2019	20:10:51	801	73	41.7	1.8
4/22/2019	20:11:51	794	72.7	41.6	1.8
4/22/2019	20:12:51	788	72.6	41.5	1.8
4/22/2019	20:13:51	789	72.6	41.3	1.8
4/22/2019	20:14:51	799	72.6	41.8	1.8
4/22/2019	20:15:51	812	72.8	43	2
4/22/2019	20:16:51	852	72.9	45.1	2.1
4/22/2019	20:17:51	945	72.9	45.3	2.4
4/22/2019	20:18:51	1042	72.9	45.6	2.5
4/22/2019	20:19:51	1197	72.6	45.9	2.6
4/22/2019	20:20:51	1395	72.4	47	2.8
4/22/2019	20:21:51	1513	72.3	47.7	2.7
4/22/2019	20:22:51	1592	72.1	47.6	2.6
4/22/2019	20:23:51	1671	72.2	50.6	2.7
4/22/2019	20:24:51	1812	72.5	53	2.7
4/22/2019	20:25:51	1810	72.7	52.5	2.6
4/22/2019	20:26:51	1800	72.8	51.7	2.6
4/22/2019	20:27:51	1731	72.8	51.2	2.5
4/22/2019	20:28:51	1709	72.9	51.2	2.5
4/22/2019	20:29:51	1707	72.8	50.9	2.5
4/22/2019	20:30:51	1733	72.9	51.1	2.5
4/22/2019	20:31:51	1719	72.9	50.8	2.6
4/22/2019	20:32:51	1701	73.1	50.6	2.5
4/22/2019	20:33:51	1783	73.4	49.8	2.5
4/22/2019	20:34:51	1707	73.2	48	2.5
4/22/2019	20:35:51	1646	73	46.8	2.5
4/22/2019	20:36:51	1653	73.1	47.1	2.5
4/22/2019	20:37:51	1658	73.2	48.3	2.5
4/22/2019	20:38:51	1632	73.3	48.8	2.5
4/22/2019	20:39:51	1586	73.2	48.1	2.4
4/22/2019	20:40:51	1563	73.4	47.5	2.5
4/22/2019	20:41:51	1582	73.9	49.3	2.5
4/22/2019	20:42:51	1563	74.3	50.9	2.5
4/22/2019	20:43:51	1521	74.6	49.7	2.6

4/22/2019	20:44:51	1477	74.6	48.3	2.5
4/22/2019	20:45:51	1423	74.5	46.9	2.6
4/22/2019	20:46:51	1376	74.5	45.8	2.5
4/22/2019	20:47:51	1345	74.5	45.3	2.5
4/22/2019	20:48:51	1295	74.4	45.7	2.2
4/22/2019	20:49:51	1224	74.3	45.4	2
4/22/2019	20:50:51	1187	74.3	45	1.8
4/22/2019	20:51:51	1147	74.2	45.2	1.7
4/22/2019	20:52:51	1128	74.1	45	1.7
4/22/2019	20:53:51	1145	74.1	45.1	1.7
4/22/2019	20:54:51	1169	74.2	45.9	1.8
4/22/2019	20:55:51	1158	74.3	46.3	1.8
4/22/2019	20:56:51	1161	74.4	45.3	1.8
4/22/2019	20:57:51	1158	74.3	44.7	1.8
4/22/2019	20:58:51	1162	74.1	44.2	1.8
4/22/2019	20:59:51	1176	73.9	43.8	1.8
4/22/2019	21:00:51	1198	74	43.8	1.8
4/22/2019	21:01:51	1185	73.8	42.9	1.8
4/22/2019	21:02:51	1249	73.7	43.6	1.8
4/22/2019	21:03:51	1212	73.7	44.3	1.8
4/22/2019	21:04:51	1201	73.8	44.9	1.7
4/22/2019	21:05:51	1194	73.6	43.8	1.8
4/22/2019	21:06:51	1173	73.5	43.9	1.8
4/22/2019	21:07:51	1174	73.6	45.2	1.8
4/22/2019	21:08:51	1173	73.8	46	1.8
4/22/2019	21:09:51	1156	74	45	1.8
4/22/2019	21:10:51	1127	74	44.7	1.8
4/22/2019	21:11:51	1106	73.9	44.3	1.8
4/22/2019	21:12:51	1098	73.8	44.1	1.8
4/22/2019	21:13:51	1113	74	44.8	1.7
4/22/2019	21:14:51	1189	74.2	44.7	1.7
4/22/2019	21:15:51	1139	74	42.9	1.8
4/22/2019	21:16:51	1118	73.9	42.7	1.8
4/22/2019	21:17:51	1118	73.8	43.3	1.7

4/22/2019	21:18:51	1137	73.9	44	1.8
4/22/2019	21:19:51	1139	73.6	43.1	1.8
4/22/2019	21:20:51	1130	73.5	43.2	1.8
4/22/2019	21:21:51	1131	73.6	44.2	1.7
4/22/2019	21:22:51	1132	73.7	45	1.7
4/22/2019	21:23:51	1111	73.9	45.3	1.7
4/22/2019	21:24:51	1108	73.6	43.9	1.8
4/22/2019	21:25:51	1114	73.3	44.1	1.8
4/22/2019	21:26:51	1116	73.5	44.2	1.8
4/22/2019	21:27:51	1178	73.8	44.4	1.7
4/22/2019	21:28:51	1119	73.8	43.9	1.7
4/22/2019	21:29:51	1081	73.7	43.6	1.7
4/22/2019	21:30:51	1073	73.7	43.4	1.7
4/22/2019	21:31:51	1079	73.6	43	1.7
4/22/2019	21:32:51	1065	73.4	43.3	1.7
4/22/2019	21:33:51	1076	73.5	43.1	1.7
4/22/2019	21:34:51	1075	73.5	44	1.7
4/22/2019	21:35:51	1065	73.4	44.9	1.8
4/22/2019	21:36:51	1066	73.5	44.8	1.7
4/22/2019	21:37:51	1049	73.5	45	1.7
4/22/2019	21:38:51	1052	73.3	44.4	1.7
4/22/2019	21:39:51	1074	73.3	43.8	1.8
4/22/2019	21:40:51	1069	73.2	43.3	1.8
4/22/2019	21:41:51	1096	73.1	41.9	1.8
4/22/2019	21:42:51	1114	72.9	42.1	1.9
4/22/2019	21:43:51	1116	72.9	43.4	1.7
4/22/2019	21:44:51	1114	73.1	44.4	1.7
4/22/2019	21:45:51	1177	72.9	43.9	1.9
4/22/2019	21:46:51	1185	72.8	44.7	1.9
4/22/2019	21:47:51	1210	72.9	47.3	1.8
4/22/2019	21:48:51	1219	73	49.6	2.1
4/22/2019	21:49:51	1217	73.1	50.4	1.9
4/22/2019	21:50:51	1200	73.2	50.4	1.9
4/22/2019	21:51:51	1220	73.1	50.1	1.9

4/22/2019	21:52:51	1173	73	50.7	1.7
4/22/2019	21:53:51	1011	72.5	51.6	1.4
4/22/2019	21:54:51	1012	72.7	51.6	1.4
4/22/2019	21:55:51	1020	72.7	51.3	1.3
4/22/2019	21:56:51	1075	72.6	50.9	1.5
4/22/2019	21:57:51	1108	72.9	52.3	1.5
4/22/2019	21:58:51	1149	73.1	53.8	1.6
4/22/2019	21:59:51	1170	73.1	53.2	1.7
4/22/2019	22:00:51	1297	73.7	53.5	2.2
4/22/2019	22:01:51	1580	75.7	56.7	3.8
4/22/2019	22:02:51	1914	79.5	59.1	4.8
4/22/2019	22:03:51	2017	80.1	53.8	5.4
4/22/2019	22:04:51	1809	78.8	52.2	5.6
4/22/2019	22:05:51	1620	77.9	53	4.8
4/22/2019	22:06:51	1517	77.2	52.7	4.2
4/22/2019	22:07:51	1470	76.5	53.1	3.8
4/22/2019	22:08:51	1437	75.6	53.2	3.5
4/22/2019	22:09:51	1406	74.7	53.7	3.4
4/22/2019	22:10:51	1186	74.2	54.7	2.3
4/22/2019	22:11:51	1176	74.2	55.2	2.5
4/22/2019	22:12:51	1137	73.9	55.9	2.5
4/22/2019	22:13:51	1118	73.7	55.4	2.5
4/22/2019	22:14:51	1076	73.5	55.3	2.4
4/22/2019	22:15:51	1070	73.2	53.9	2.5
4/22/2019	22:16:51	1067	72.8	52.2	2.5
4/22/2019	22:17:51	1066	72.6	52	2.5
4/22/2019	22:18:51	1071	72.8	52.2	2.5
4/22/2019	22:19:51	1060	72.6	51.7	2.5
4/22/2019	22:20:51	1050	72.4	50.7	2.5
4/22/2019	22:21:51	1043	72.3	50.1	2.4
4/22/2019	22:22:51	1039	71.9	49.2	2.4
4/22/2019	22:23:51	1042	71.7	48.2	2.4
4/22/2019	22:24:51	1044	71.5	47.4	2.3
4/22/2019	22:25:51	1042	71.4	47.5	2.4

4/22/2019	22:26:51	1042	71.5	48.1	2.4
4/22/2019	22:27:51	1032	71.6	47.6	2.4
4/22/2019	22:28:51	1028	71.3	47.6	2.4
4/22/2019	22:29:51	1028	71.2	47.5	2.4
4/22/2019	22:30:51	1027	71.3	48.2	2.5
4/22/2019	22:31:51	1016	71.3	48.2	2.4
4/22/2019	22:32:51	1006	71.3	47.9	2.4
4/22/2019	22:33:51	982	71.3	48.1	2.1
4/22/2019	22:34:51	955	71.2	48.1	1.9
4/22/2019	22:35:51	939	71.1	47.6	1.9
4/22/2019	22:36:51	922	70.9	47.3	1.8
4/22/2019	22:37:51	912	70.7	47.2	1.8
4/22/2019	22:38:51	905	70.8	47.3	1.8
4/22/2019	22:39:51	913	70.7	46.4	1.9
4/22/2019	22:40:51	908	70.6	46.3	1.9
4/22/2019	22:41:51	914	70.7	46.8	1.9
4/22/2019	22:42:51	919	70.7	47.1	2.1
4/22/2019	22:43:51	912	70.7	46.9	1.9
4/22/2019	22:44:51	909	70.4	46.7	1.9
4/22/2019	22:45:51	909	70.6	47.2	2
4/22/2019	22:46:51	916	70.6	47.9	2.1
4/22/2019	22:47:51	914	70.6	47.6	2.1
4/22/2019	22:48:51	914	70.5	47	2.1
4/22/2019	22:49:51	914	70.5	46.4	2.1
4/22/2019	22:50:51	920	70	45.4	2
4/22/2019	22:51:51	927	69.7	44.8	1.9
4/22/2019	22:52:51	944	70	47	1.9
4/22/2019	22:53:51	973	70.2	48.7	1.9
4/22/2019	22:54:51	1039	70.4	48.6	2
4/22/2019	22:55:51	1047	70.2	46.6	1.9
4/22/2019	22:56:51	1045	70.3	48.3	1.9
4/22/2019	22:57:51	1026	70.4	50.8	1.7
4/22/2019	22:58:51	935	70.5	50.8	1.7
4/22/2019	22:59:51	923	70.4	50.2	1.7



4/22/2019	23:00:51	918	70.5	49.9	1.7
4/22/2019	23:01:51	921	70.5	49.4	1.8
4/22/2019	23:02:51	916	70.5	48.9	1.8
4/22/2019	23:03:51	899	70.4	48.5	1.7
4/22/2019	23:04:51	906	69.9	46.4	1.7
4/22/2019	23:05:51	937	69.7	47.2	1.7
4/22/2019	23:06:51	960	69.8	49.2	1.7
4/22/2019	23:07:51	988	70	50.2	1.8
4/22/2019	23:08:51	1032	69.8	48.1	1.7
4/22/2019	23:09:51	1074	69.7	48.8	1.7
4/22/2019	23:10:51	1049	69.9	50.2	1.8
4/22/2019	23:11:51	1027	70.1	51.3	1.8
4/22/2019	23:12:51	1020	70.1	49.3	1.8
4/22/2019	23:13:51	1020	70	48.7	1.8
4/22/2019	23:14:51	1065	70	48.4	1.8
4/22/2019	23:15:51	1077	69.9	47.8	1.8
4/22/2019	23:16:51	1050	69.5	46.5	1.8
4/22/2019	23:17:51	1026	69.6	46.9	1.8
4/22/2019	23:18:51	1013	69.7	48.5	1.7
4/22/2019	23:19:51	1011	69.9	49.8	1.7
4/22/2019	23:20:51	990	69.9	49.2	1.7
4/22/2019	23:21:51	966	69.8	49.1	1.7
4/22/2019	23:22:51	954	69.8	49.1	1.7
4/22/2019	23:23:51	957	69.8	48.8	1.7
4/22/2019	23:24:51	930	69.7	49	1.7
4/22/2019	23:25:51	936	69.4	48.1	1.7
4/22/2019	23:26:51	938	69.5	48.3	1.7
4/22/2019	23:27:51	939	69.5	48	1.7
4/22/2019	23:28:51	947	69.4	47.3	1.7
4/22/2019	23:29:51	941	69	45.9	1.7
4/22/2019	23:30:51	954	69.1	47.1	1.7
4/22/2019	23:31:51	971	69.3	49.6	1.7
4/22/2019	23:32:51	973	69.5	50.1	1.7
4/22/2019	23:33:51	984	69.4	48.7	1.8

4/22/2019	23:34:51	967	69.4	48.8	1.7
4/22/2019	23:35:51	954	69.5	50.4	1.7
4/22/2019	23:36:51	945	69.7	50.8	1.7
4/22/2019	23:37:51	935	69.3	48.8	1.8
4/22/2019	23:38:51	916	69.2	48.9	1.8
4/22/2019	23:39:51	912	69.4	50.6	1.8
4/22/2019	23:40:51	906	69.6	51.2	1.7
4/22/2019	23:41:51	892	69.6	50.3	1.7
4/22/2019	23:42:51	879	69.4	49.7	1.7
4/22/2019	23:43:51	874	69.3	49.1	1.7
4/22/2019	23:44:51	873	68.9	48	1.8
4/22/2019	23:45:51	857	68.9	48.6	1.7
4/22/2019	23:46:51	842	68.9	48.9	1.7
4/22/2019	23:47:51	830	68.8	49	1.7
4/22/2019	23:48:51	808	68.8	49.5	1.7
4/22/2019	23:49:51	803	68.7	48.6	1.7
4/22/2019	23:50:51	808	68.7	48.7	1.7
4/22/2019	23:51:51	808	68.8	50.4	1.7
4/22/2019	23:52:51	810	69.1	51.4	1.7
4/22/2019	23:53:51	813	69.3	51.5	1.7
4/22/2019	23:54:51	799	69.7	51.5	1.6
4/22/2019	23:55:51	799	70	50.9	1.5
4/22/2019	23:56:51	798	70.3	49.8	1.4
4/22/2019	23:57:51	806	70.5	48.4	1.4
4/22/2019	23:58:51	806	70.5	47.7	1.6
4/22/2019	23:59:51	806	69.6	45.4	1.7
4/23/2019	0:00:51	808	69.6	47.2	1.7
4/23/2019	0:01:51	807	69.7	49.4	1.6
4/23/2019	0:02:51	811	69.7	49.9	1.7
4/23/2019	0:03:51	811	69.2	48.4	1.7
4/23/2019	0:04:51	806	69.1	48.9	1.6
4/23/2019	0:05:51	805	69.3	50.8	1.6
4/23/2019	0:06:51	806	69.4	51.5	1.7
4/23/2019	0:07:51	807	69.4	50.8	1.7

4/23/2019	0:08:51	804	69.3	50.3	1.7
4/23/2019	0:09:51	798	69.1	50	1.7
4/23/2019	0:10:51	799	68.9	48.8	1.7
4/23/2019	0:11:51	802	68.6	48	1.7
4/23/2019	0:12:51	806	68.8	49.9	1.6
4/23/2019	0:13:51	807	69	51.1	1.7
4/23/2019	0:14:51	805	69	51	1.7
4/23/2019	0:15:51	796	68.8	50.7	1.7
4/23/2019	0:16:51	790	69	51.2	1.7
4/23/2019	0:17:51	791	69.4	52.3	1.5
4/23/2019	0:18:51	787	69.7	52.6	1.5
4/23/2019	0:19:51	754	70.1	52.7	1.4
4/23/2019	0:20:51	717	70.4	52.8	1.2
4/23/2019	0:21:51	713	70.6	52.1	1.1
4/23/2019	0:22:51	730	70.8	50.7	1.2
4/23/2019	0:23:51	737	70.5	48.5	1.6
4/23/2019	0:24:51	739	69.6	46.7	1.6
4/23/2019	0:25:51	747	69.6	48.1	1.5
4/23/2019	0:26:51	750	69.8	49.9	1.4
4/23/2019	0:27:51	756	69.6	50.3	1.5
4/23/2019	0:28:51	756	68.9	48.6	1.6
4/23/2019	0:29:51	756	69	49.7	1.6
4/23/2019	0:30:51	756	69.1	51.6	1.5
4/23/2019	0:31:51	760	69.2	52.2	1.5
4/23/2019	0:32:51	759	68.6	50.2	1.6
4/23/2019	0:33:51	758	68.6	50.2	1.6
4/23/2019	0:34:51	759	68.9	51.9	1.6
4/23/2019	0:35:51	761	69.1	52.9	1.6
4/23/2019	0:36:51	767	69.3	52.8	1.6
4/23/2019	0:37:51	758	69.6	52.8	1.6
4/23/2019	0:38:51	750	69.9	52.4	1.5
4/23/2019	0:39:51	743	70.1	51.1	1.4
4/23/2019	0:40:51	740	70.3	49.7	1.3
4/23/2019	0:41:51	740	70.5	49.1	1.2

4/23/2019	0:42:51	741	70.6	48.7	1.1
4/23/2019	0:43:51	740	70.8	48.4	1
4/23/2019	0:44:51	748	70.7	48.2	1.5
4/23/2019	0:45:51	755	70.4	47	1.5
4/23/2019	0:46:51	760	70.1	47	1.6
4/23/2019	0:47:51	763	70	48.6	1.6
4/23/2019	0:48:51	765	70	49.9	1.6
4/23/2019	0:49:51	763	69.9	49.7	1.6
4/23/2019	0:50:51	757	69.6	49.1	1.6
4/23/2019	0:51:51	753	69.1	48.9	1.6
4/23/2019	0:52:51	754	68.9	48.8	1.6
4/23/2019	0:53:51	755	68.9	48.2	1.5
4/23/2019	0:54:51	763	68.9	48.7	1.7
4/23/2019	0:55:51	764	69.2	49.2	1.6
4/23/2019	0:56:51	762	69.4	49.2	1.5
4/23/2019	0:57:51	757	69.7	49.2	1.4
4/23/2019	0:58:51	747	70	48.9	1.3
4/23/2019	0:59:51	744	70.2	48.6	1.2
4/23/2019	1:00:51	737	70.4	48.5	1.2
4/23/2019	1:01:51	729	70.6	48.3	1.3
4/23/2019	1:02:51	740	70.7	48.2	1.5
4/23/2019	1:03:51	757	70.8	48.1	1.7
4/23/2019	1:04:51	757	70.7	46.7	1.7
4/23/2019	1:05:51	745	70.3	46.4	1.6
4/23/2019	1:06:51	744	69.6	45.4	1.6
4/23/2019	1:07:51	749	69.2	45	1.6
4/23/2019	1:08:51	750	69.3	47.3	1.5
4/23/2019	1:09:51	748	69.4	49	1.4
4/23/2019	1:10:51	751	69.1	48.4	1.6
4/23/2019	1:11:51	750	68.8	47.6	1.6
4/23/2019	1:12:51	749	68.9	49.3	1.6
4/23/2019	1:13:51	750	69	50.4	1.5
4/23/2019	1:14:51	753	69.2	50.5	1.6
4/23/2019	1:15:51	749	69.5	51.1	1.6

4/23/2019	1:16:51	750	69.8	51.1	1.7
4/23/2019	1:17:51	730	70	51	1.4
4/23/2019	1:18:51	732	70.2	50.2	1.3
4/23/2019	1:19:51	731	70.4	48.8	1.2
4/23/2019	1:20:51	731	70.5	47.5	1.1
4/23/2019	1:21:51	730	70.7	47.5	1.1
4/23/2019	1:22:51	734	70.7	47.3	1.1
4/23/2019	1:23:51	725	70.8	47.4	1
4/23/2019	1:24:51	722	70.9	47.5	1
4/23/2019	1:25:51	712	71	47.7	1
4/23/2019	1:26:51	719	71.1	47.6	1
4/23/2019	1:27:51	719	71.2	47.5	1.1
4/23/2019	1:28:51	720	71.2	47.5	1.2
4/23/2019	1:29:51	733	70.9	46.4	1.6
4/23/2019	1:30:51	738	70.2	46.2	1.6
4/23/2019	1:31:51	737	69.8	46.6	1.5
4/23/2019	1:32:51	739	69.5	46.5	1.6
4/23/2019	1:33:51	740	69.4	46.6	1.6
4/23/2019	1:34:51	746	69	45.9	1.6
4/23/2019	1:35:51	750	68.9	46.8	1.6
4/23/2019	1:36:51	749	68.9	48.6	1.6
4/23/2019	1:37:51	750	69	49.8	1.6
4/23/2019	1:38:51	743	69.3	50.1	1.5
4/23/2019	1:39:51	739	69.6	50	1.6
4/23/2019	1:40:51	735	69.8	49.7	1.4
4/23/2019	1:41:51	733	70.1	49.2	1.4
4/23/2019	1:42:51	727	70.3	48.8	1.3
4/23/2019	1:43:51	735	70.5	48.9	1.7
4/23/2019	1:44:51	725	70.6	49.3	1.5
4/23/2019	1:45:51	707	70.8	49.2	1.2
4/23/2019	1:46:51	714	70.9	48.2	1.2
4/23/2019	1:47:51	722	70.9	47.2	1.2
4/23/2019	1:48:51	731	71	46	1.3
4/23/2019	1:49:51	727	71.1	45.9	1.2

4/23/2019	1:50:51	726	71.1	46	1.2
4/23/2019	1:51:51	711	71.1	46.5	1
4/23/2019	1:52:51	718	71.2	46.1	1
4/23/2019	1:53:51	714	71.3	46.4	1
4/23/2019	1:54:51	707	71.3	46.6	1
4/23/2019	1:55:51	709	71.4	46.7	1.1
4/23/2019	1:56:51	713	71.5	46.6	1.2
4/23/2019	1:57:51	724	71.5	46.8	1.6
4/23/2019	1:58:51	699	71.6	47.7	1.3
4/23/2019	1:59:51	690	71.6	47.9	1
4/23/2019	2:00:51	710	71.6	46.6	1.2
4/23/2019	2:01:51	726	71.6	45.4	1.2
4/23/2019	2:02:51	731	71.6	44.7	1.1
4/23/2019	2:03:51	734	71.6	44.6	1.2
4/23/2019	2:04:51	719	71.6	45	1
4/23/2019	2:05:51	713	71.7	45.4	1
4/23/2019	2:06:51	701	71.7	45.9	0.9
4/23/2019	2:07:51	698	71.7	46	1
4/23/2019	2:08:51	699	71.8	46	0.9
4/23/2019	2:09:51	703	71.8	46.1	0.9
4/23/2019	2:10:51	718	71.8	46.3	1.3
4/23/2019	2:11:51	727	71.8	46.6	1.5
4/23/2019	2:12:51	722	71.9	47.2	1.2
4/23/2019	2:13:51	724	71.9	47.1	1
4/23/2019	2:14:51	731	71.8	45.9	1.1
4/23/2019	2:15:51	734	71.8	44.8	1.2
4/23/2019	2:16:51	736	71.8	44.5	1.2
4/23/2019	2:17:51	741	71.8	44.5	1.1
4/23/2019	2:18:51	738	71.8	44.9	1.2
4/23/2019	2:19:51	723	71.8	45.6	1
4/23/2019	2:20:51	738	71.8	45.9	1
4/23/2019	2:21:51	736	71.8	46.3	1
4/23/2019	2:22:51	741	71.9	46.3	1.1
4/23/2019	2:23:51	735	71.9	46.7	1



4/23/2019	2:24:51	729	71.9	47	1.1
4/23/2019	2:25:51	749	71.9	46.8	1.6
4/23/2019	2:26:51	741	72	47	1.3
4/23/2019	2:27:51	738	71.9	47.1	1.1
4/23/2019	2:28:51	739	71.9	46.3	1.2
4/23/2019	2:29:51	744	71.8	45.1	1.2
4/23/2019	2:30:51	742	71.8	44.5	1.1
4/23/2019	2:31:51	736	71.7	44.4	1.1
4/23/2019	2:32:51	733	71.8	44.8	1.2
4/23/2019	2:33:51	723	71.8	45.5	1.1
4/23/2019	2:34:51	726	71.8	45.8	1.1
4/23/2019	2:35:51	727	71.8	46	1.1
4/23/2019	2:36:51	726	71.8	46.3	1
4/23/2019	2:37:51	722	71.8	46.6	1.1
4/23/2019	2:38:51	712	71.8	47	1.1
4/23/2019	2:39:51	711	71.8	46.9	1.1
4/23/2019	2:40:51	723	71.8	47	1.5
4/23/2019	2:41:51	718	71.7	47.3	1.3
4/23/2019	2:42:51	732	71.8	46.6	1.4
4/23/2019	2:43:51	726	71.8	46	1.3
4/23/2019	2:44:51	736	71.7	45.5	1.3
4/23/2019	2:45:51	744	71.6	45.2	1.3
4/23/2019	2:46:51	740	71.7	45.3	1.3
4/23/2019	2:47:51	716	71.7	45.6	1.1
4/23/2019	2:48:51	711	71.8	45.4	1.1
4/23/2019	2:49:51	724	71.8	45.7	1.2
4/23/2019	2:50:51	734	71.8	46.1	1.5
4/23/2019	2:51:51	725	71.9	46.1	1.2
4/23/2019	2:52:51	724	71.9	45.9	1.1
4/23/2019	2:53:51	719	72	46.2	1.2
4/23/2019	2:54:51	721	72	45.9	1.4
4/23/2019	2:55:51	730	72	46.1	1.6
4/23/2019	2:56:51	726	72	46	1.4
4/23/2019	2:57:51	706	72	46.4	1.2

4/23/2019	2:58:51	711	72	45.6	1.2
4/23/2019	2:59:51	717	71.9	44.8	1.2
4/23/2019	3:00:51	721	71.9	44.3	1.2
4/23/2019	3:01:51	722	71.9	44.1	1.2
4/23/2019	3:02:51	719	71.9	44.3	1.1
4/23/2019	3:03:51	717	71.9	44.5	1.2
4/23/2019	3:04:51	714	71.9	44.7	1.1
4/23/2019	3:05:51	713	71.9	44.9	1.1
4/23/2019	3:06:51	714	71.9	45.1	1.1
4/23/2019	3:07:51	713	71.9	45.4	1.3
4/23/2019	3:08:51	711	71.9	45.6	1.2
4/23/2019	3:09:51	711	71.9	45.8	1.3
4/23/2019	3:10:51	711	71.9	46.3	1.6
4/23/2019	3:11:51	698	71.9	46.6	1.2
4/23/2019	3:12:51	685	71.9	46.8	1.1
4/23/2019	3:13:51	687	71.9	45.9	1.1
4/23/2019	3:14:51	700	71.9	45	1.3
4/23/2019	3:15:51	705	71.8	44.6	1.3
4/23/2019	3:16:51	703	71.8	44.7	1.2
4/23/2019	3:17:51	694	71.8	45.1	1.1
4/23/2019	3:18:51	693	71.8	45.4	1.1
4/23/2019	3:19:51	694	71.8	45.3	1.1
4/23/2019	3:20:51	696	71.8	45.4	1.1
4/23/2019	3:21:51	694	71.9	45.9	1.1
4/23/2019	3:22:51	680	71.9	46.5	1.2
4/23/2019	3:23:51	664	71.9	47	1
4/23/2019	3:24:51	665	71.9	47.1	1.1
4/23/2019	3:25:51	682	71.9	47	1.4
4/23/2019	3:26:51	675	71.9	47.4	1.3
4/23/2019	3:27:51	663	71.9	47.8	1.1
4/23/2019	3:28:51	671	71.9	46.9	1.1
4/23/2019	3:29:51	688	71.9	45.4	1.3
4/23/2019	3:30:51	693	71.9	44.8	1.2
4/23/2019	3:31:51	693	71.9	44.9	1.2

4/23/2019	3:32:51	692	71.8	44.9	1.1
4/23/2019	3:33:51	688	71.9	45.3	1.2
4/23/2019	3:34:51	678	71.8	45.8	1
4/23/2019	3:35:51	676	71.9	46	1
4/23/2019	3:36:51	663	71.9	46.5	1
4/23/2019	3:37:51	659	71.9	46.9	1
4/23/2019	3:38:51	653	71.9	47.2	1
4/23/2019	3:39:51	655	71.9	47.5	1.1
4/23/2019	3:40:51	660	71.8	47.4	1.2
4/23/2019	3:41:51	672	71.8	47.7	1.5
4/23/2019	3:42:51	666	71.9	48	1.2
4/23/2019	3:43:51	657	71.9	47.9	1.1
4/23/2019	3:44:51	667	71.9	46.6	1.2
4/23/2019	3:45:51	678	71.8	45.9	1.1
4/23/2019	3:46:51	681	71.8	45.5	1.1
4/23/2019	3:47:51	684	71.8	45.3	1.1
4/23/2019	3:48:51	673	71.9	45.9	1.1
4/23/2019	3:49:51	656	71.8	46.6	1
4/23/2019	3:50:51	649	71.8	47.1	1
4/23/2019	3:51:51	648	71.8	47.1	1
4/23/2019	3:52:51	648	71.8	47.4	0.9
4/23/2019	3:53:51	649	71.8	47.7	1
4/23/2019	3:54:51	652	71.7	47.9	1.1
4/23/2019	3:55:51	681	71.7	47.7	1.6
4/23/2019	3:56:51	674	71.8	48	1.3
4/23/2019	3:57:51	664	71.8	48.4	1.1
4/23/2019	3:58:51	659	71.8	47.5	1
4/23/2019	3:59:51	675	71.8	46.5	1.1
4/23/2019	4:00:51	681	71.8	45.7	1.1
4/23/2019	4:01:51	681	71.8	45.4	1.1
4/23/2019	4:02:51	669	71.8	46.1	1
4/23/2019	4:03:51	676	71.8	46.2	1.1
4/23/2019	4:04:51	675	71.8	46.8	1.1
4/23/2019	4:05:51	674	71.8	47.1	1

4/23/2019	4:06:51	681	71.8	47.3	1
4/23/2019	4:07:51	688	71.8	47.7	1
4/23/2019	4:08:51	682	71.9	48.1	1
4/23/2019	4:09:51	690	71.9	48.3	1
4/23/2019	4:10:51	693	71.9	48.4	1
4/23/2019	4:11:51	711	71.9	48.3	1.4
4/23/2019	4:12:51	700	71.9	48.3	1.1
4/23/2019	4:13:51	688	71.9	48.4	1.1
4/23/2019	4:14:51	687	71.9	47	1.2
4/23/2019	4:15:51	692	71.8	45.9	1.2
4/23/2019	4:16:51	689	71.8	45.8	1.1
4/23/2019	4:17:51	697	71.8	45.8	1.2
4/23/2019	4:18:51	693	71.8	46.2	1.1
4/23/2019	4:19:51	676	71.8	46.8	1
4/23/2019	4:20:51	675	71.8	47	1.1
4/23/2019	4:21:51	671	71.8	47.5	0.9
4/23/2019	4:22:51	673	71.9	47.8	0.9
4/23/2019	4:23:51	673	71.9	48.1	1
4/23/2019	4:24:51	682	71.9	48.1	1
4/23/2019	4:25:51	688	71.9	48.2	1.1
4/23/2019	4:26:51	685	71.9	48.5	1.3
4/23/2019	4:27:51	685	71.9	48.4	1.1
4/23/2019	4:28:51	671	71.9	48.5	1
4/23/2019	4:29:51	678	71.8	47.1	1.1
4/23/2019	4:30:51	683	71.8	46.2	1.1
4/23/2019	4:31:51	675	71.8	46.1	1.1
4/23/2019	4:32:51	682	71.8	46.2	1.1
4/23/2019	4:33:51	673	71.7	46.6	1
4/23/2019	4:34:51	663	71.7	47.1	1.1
4/23/2019	4:35:51	660	71.7	47.4	1
4/23/2019	4:36:51	662	71.8	47.6	0.9
4/23/2019	4:37:51	655	71.8	48.1	0.9
4/23/2019	4:38:51	651	71.8	48.4	0.9
4/23/2019	4:39:51	663	71.7	48.5	1.1

4/23/2019	4:40:51	697	71.7	48.7	1.6
4/23/2019	4:41:51	698	71.8	49	1.4
4/23/2019	4:42:51	675	71.8	49.2	1.2
4/23/2019	4:43:51	658	71.8	49.1	1
4/23/2019	4:44:51	669	71.7	47.8	1.1
4/23/2019	4:45:51	678	71.7	46.7	1.2
4/23/2019	4:46:51	671	71.7	46.6	1
4/23/2019	4:47:51	658	71.7	47	0.9
4/23/2019	4:48:51	655	71.7	47.2	0.9
4/23/2019	4:49:51	651	71.7	47.5	1
4/23/2019	4:50:51	645	71.7	47.8	1
4/23/2019	4:51:51	646	71.7	47.9	1
4/23/2019	4:52:51	647	71.8	47.9	1
4/23/2019	4:53:51	642	71.8	48.2	1
4/23/2019	4:54:51	639	71.8	48.5	0.9
4/23/2019	4:55:51	643	71.8	48.4	1.1
4/23/2019	4:56:51	661	71.8	48.3	1.4
4/23/2019	4:57:51	646	71.8	48.8	1.1
4/23/2019	4:58:51	647	71.8	49.1	1
4/23/2019	4:59:51	648	71.8	48.4	1.1
4/23/2019	5:00:51	667	71.7	46.7	1.1
4/23/2019	5:01:51	664	71.7	46.5	1.1
4/23/2019	5:02:51	663	71.7	46.4	1
4/23/2019	5:03:51	656	71.7	46.7	1.1
4/23/2019	5:04:51	650	71.7	47.1	1
4/23/2019	5:05:51	636	71.7	47.5	0.9
4/23/2019	5:06:51	637	71.7	47.8	1
4/23/2019	5:07:51	639	71.7	48	1
4/23/2019	5:08:51	640	71.7	48.2	1
4/23/2019	5:09:51	638	71.7	48.4	0.9
4/23/2019	5:10:51	637	71.7	48.6	0.9
4/23/2019	5:11:51	643	71.7	48.4	1.1
4/23/2019	5:12:51	662	71.8	48.5	1.4
4/23/2019	5:13:51	665	71.8	48.4	1.2

4/23/2019	5:14:51	652	71.7	48.7	1
4/23/2019	5:15:51	654	71.7	47.6	1.1
4/23/2019	5:16:51	664	71.7	46.6	1.1
4/23/2019	5:17:51	660	71.6	46.8	1.1
4/23/2019	5:18:51	663	71.6	46.6	1.1
4/23/2019	5:19:51	651	71.6	47	1
4/23/2019	5:20:51	648	71.6	47.2	1
4/23/2019	5:21:51	639	71.6	47.6	1
4/23/2019	5:22:51	645	71.6	47.6	1
4/23/2019	5:23:51	636	71.6	48	1
4/23/2019	5:24:51	638	71.7	48	1
4/23/2019	5:25:51	633	71.7	48.3	1
4/23/2019	5:26:51	632	71.7	48.3	1
4/23/2019	5:27:51	654	71.7	48.2	1.3
4/23/2019	5:28:51	648	71.7	48.5	1.1
4/23/2019	5:29:51	645	71.7	48.7	1.1
4/23/2019	5:30:51	641	71.6	48	1
4/23/2019	5:31:51	649	71.6	47	1.1
4/23/2019	5:32:51	644	71.6	46.7	1.1
4/23/2019	5:33:51	645	71.6	46.6	1.1
4/23/2019	5:34:51	640	71.5	46.9	1
4/23/2019	5:35:51	648	71.4	47.1	1.1
4/23/2019	5:36:51	694	71.3	47.8	1.4
4/23/2019	5:37:51	696	71.4	48.1	1.3
4/23/2019	5:38:51	665	71.4	48.2	1.2
4/23/2019	5:39:51	654	71.4	48.3	1.1
4/23/2019	5:40:51	684	71.4	48.8	1.4
4/23/2019	5:41:51	678	71.5	49.1	1.3
4/23/2019	5:42:51	660	71.6	49.4	1.3
4/23/2019	5:43:51	684	71.6	48.9	1.7
4/23/2019	5:44:51	661	71.7	49.4	1.4
4/23/2019	5:45:51	639	71.8	49.7	1.2
4/23/2019	5:46:51	643	71.8	49.1	1.1
4/23/2019	5:47:51	655	71.8	48.3	1.2



4/23/2019	5:48:51	654	71.9	47.7	1.1
4/23/2019	5:49:51	665	71.9	47.5	1.2
4/23/2019	5:50:51	651	72	47.8	1.1
4/23/2019	5:51:51	678	71.8	47.9	1.5
4/23/2019	5:52:51	736	71.9	48.9	1.7
4/23/2019	5:53:51	712	71.9	48.8	1.5
4/23/2019	5:54:51	686	72	48.6	1.3
4/23/2019	5:55:51	660	71.9	48.9	1
4/23/2019	5:56:51	658	72	48.9	1
4/23/2019	5:57:51	661	72	48.9	1.1
4/23/2019	5:58:51	660	72	49.1	1
4/23/2019	5:59:51	689	72	49.4	1.7
4/23/2019	6:00:51	659	71.9	49.6	1.2
4/23/2019	6:01:51	652	71.9	49.8	1.1
4/23/2019	6:02:51	661	71.8	48.7	1
4/23/2019	6:03:51	669	71.8	47.5	1.1
4/23/2019	6:04:51	674	71.8	47	1.1
4/23/2019	6:05:51	679	71.8	46.7	1.1
4/23/2019	6:06:51	674	71.8	46.9	1.1
4/23/2019	6:07:51	668	71.8	47	1.2
4/23/2019	6:08:51	660	71.8	47.4	1
4/23/2019	6:09:51	666	71.8	47.2	1.1
4/23/2019	6:10:51	655	71.8	47.7	1.1
4/23/2019	6:11:51	655	71.8	47.8	1.1
4/23/2019	6:12:51	654	71.9	47.9	1
4/23/2019	6:13:51	647	71.9	48.2	1.1
4/23/2019	6:14:51	1203	71.9	52.7	1.6
4/23/2019	6:15:51	791	71.9	50.2	1.7
4/23/2019	6:16:51	716	72	49.9	1.7
4/23/2019	6:17:51	714	72.1	49.9	1.6
4/23/2019	6:18:51	713	72.1	49.8	1.5
4/23/2019	6:19:51	705	72	49	1.3
4/23/2019	6:20:51	741	72	49.1	1.6
4/23/2019	6:21:51	721	71.9	48	1.6

4/23/2019	6:22:51	702	71.9	47.7	1.4
4/23/2019	6:23:51	674	71.9	47.8	1.2
4/23/2019	6:24:51	665	71.9	48	1.1
4/23/2019	6:25:51	662	71.9	48.1	1.1
4/23/2019	6:26:51	652	71.9	48.2	1.1
4/23/2019	6:27:51	648	71.9	48.4	1.1
4/23/2019	6:28:51	648	71.9	48.6	1.1
4/23/2019	6:29:51	644	71.9	48.9	1.1
4/23/2019	6:30:51	650	71.8	49.1	1.2
4/23/2019	6:31:51	682	71.8	49.5	1.6
4/23/2019	6:32:51	720	71.8	50.5	1.8
4/23/2019	6:33:51	708	71.7	50.5	1.4
4/23/2019	6:34:51	702	71.8	49.7	1.4
4/23/2019	6:35:51	689	71.7	49	1.3
4/23/2019	6:36:51	707	71.5	48.1	1.6
4/23/2019	6:37:51	742	71.4	49.3	1.7
4/23/2019	6:38:51	765	71.6	50.1	1.7
4/23/2019	6:39:51	724	71.7	49.2	1.6
4/23/2019	6:40:51	704	71.7	49	1.4
4/23/2019	6:41:51	719	71.7	49.2	1.5
4/23/2019	6:42:51	717	71.8	49.5	1.5
4/23/2019	6:43:51	695	71.8	49.5	1.3
4/23/2019	6:44:51	692	71.9	49.5	1.4
4/23/2019	6:45:51	694	71.9	49.4	1.4
4/23/2019	6:46:51	700	71.9	49.6	1.5
4/23/2019	6:47:51	732	71.9	50.6	1.7
4/23/2019	6:48:51	723	72	51	1.6
4/23/2019	6:49:51	755	72.1	51.7	1.8
4/23/2019	6:50:51	820	71.9	49.7	1.8
4/23/2019	6:51:51	795	71.4	49.4	1.8
4/23/2019	6:52:51	793	71	48.3	1.8
4/23/2019	6:53:51	804	70.6	48.7	1.8
4/23/2019	6:54:51	825	70.7	49.8	1.7
4/23/2019	6:55:51	821	70.8	50	1.7

4/23/2019	6:56:51	802	71	50.2	1.7
4/23/2019	6:57:51	770	71.2	50.6	1.7
4/23/2019	6:58:51	790	71.3	50.3	1.7
4/23/2019	6:59:51	811	71.5	50.9	1.7
4/23/2019	7:00:51	836	71.7	50.8	1.8
4/23/2019	7:01:51	816	71.8	50.9	1.7
4/23/2019	7:02:51	807	72	51	1.6
4/23/2019	7:03:51	797	72.1	51.1	1.6
4/23/2019	7:04:51	784	72.2	50.7	1.6
4/23/2019	7:05:51	768	72.3	50.3	1.6
4/23/2019	7:06:51	848	72.3	51.2	1.7
4/23/2019	7:07:51	837	72.4	51.1	1.7
4/23/2019	7:08:51	780	72.3	50.3	1.6
4/23/2019	7:09:51	763	72.3	49.8	1.5
4/23/2019	7:10:51	757	72.3	48.3	1.6
4/23/2019	7:11:51	765	72.3	47.1	1.5
4/23/2019	7:12:51	762	72.2	46.6	1.5
4/23/2019	7:13:51	746	72.2	46.9	1.5
4/23/2019	7:14:51	734	72.1	47.2	1.3
4/23/2019	7:15:51	734	72.1	47.2	1.3
4/23/2019	7:16:51	730	72.1	47.4	1.2
4/23/2019	7:17:51	730	72.1	47.6	1.4
4/23/2019	7:18:51	736	71.9	47.8	1.4
4/23/2019	7:19:51	759	71.8	48.4	1.5
4/23/2019	7:20:51	756	71.9	48.7	1.5
4/23/2019	7:21:51	739	72	49.2	1.6
4/23/2019	7:22:51	760	72.1	49	1.4
4/23/2019	7:23:51	775	72.1	49.4	1.6
4/23/2019	7:24:51	761	72.1	49.7	1.5
4/23/2019	7:25:51	731	72.1	50	1.2
4/23/2019	7:26:51	738	72	49.5	1.3
4/23/2019	7:27:51	739	72	48.8	1.3
4/23/2019	7:28:51	748	72	47.9	1.4
4/23/2019	7:29:51	761	72	48	1.3

4/23/2019	7:30:51	795	72.1	49.1	1.5
4/23/2019	7:31:51	800	72.1	50.1	1.6
4/23/2019	7:32:51	854	72.2	50.6	1.5
4/23/2019	7:33:51	929	72.2	50.9	1.6
4/23/2019	7:34:51	993	72.3	52.3	1.7
4/23/2019	7:35:51	945	72.5	52.6	1.7
4/23/2019	7:36:51	938	72.6	52.9	1.7
4/23/2019	7:37:51	933	72.7	52.5	1.6
4/23/2019	7:38:51	931	72.8	52.9	1.6
4/23/2019	7:39:51	904	72.7	53.4	1.7
4/23/2019	7:40:51	876	72.7	53.2	1.7
4/23/2019	7:41:51	852	72.7	52.9	1.6
4/23/2019	7:42:51	820	72.7	52.7	1.4
4/23/2019	7:43:51	796	72.6	52	1.2
4/23/2019	7:44:51	804	72.5	50.9	1.4
4/23/2019	7:45:51	800	72.5	50.2	1.4
4/23/2019	7:46:51	809	72.5	50.6	1.3
4/23/2019	7:47:51	875	72.4	52.9	1.5
4/23/2019	7:48:51	926	72.5	53.2	1.5
4/23/2019	7:49:51	855	72.5	53.3	1.6
4/23/2019	7:50:51	832	72.6	53.2	1.5
4/23/2019	7:51:51	850	72.6	53.7	1.7
4/23/2019	7:52:51	919	72.4	53	3
4/23/2019	7:53:51	1284	72.3	52.6	4.9
4/23/2019	7:54:51	1301	72.2	52.8	6
4/23/2019	7:55:51	1142	72.1	54	6
4/23/2019	7:56:51	1105	72	55.2	5.5
4/23/2019	7:57:51	1084	72	56.2	5.2
4/23/2019	7:58:51	1053	72.1	56.5	4.6
4/23/2019	7:59:51	1017	72.3	57.7	4.2
4/23/2019	8:00:51	984	72.5	56.9	3.6
4/23/2019	8:01:51	937	72.6	55.5	3
4/23/2019	8:02:51	872	72.7	53.2	2.6
4/23/2019	8:03:51	879	72.6	52.7	2.6

4/23/2019	8:04:51	907	72.6	52.6	2.6
4/23/2019	8:05:51	887	72.6	51.6	2.6
4/23/2019	8:06:51	856	72.7	51.2	2.5
4/23/2019	8:07:51	853	72.7	51.1	2.5
4/23/2019	8:08:51	852	72.8	51.1	2.4
4/23/2019	8:09:51	846	72.8	51.2	2.3
4/23/2019	8:10:51	854	72.8	51	2.4
4/23/2019	8:11:51	855	72.8	51	2.3
4/23/2019	8:12:51	862	72.8	51.2	2.4
4/23/2019	8:13:51	852	72.8	51	2.2
4/23/2019	8:14:51	838	72.8	51.6	2.1
4/23/2019	8:15:51	855	72.8	52	2.3
4/23/2019	8:16:51	842	72.8	52	2.1
4/23/2019	8:17:51	834	72.5	52	2
4/23/2019	8:18:51	861	72.6	51.2	2.2
4/23/2019	8:19:51	851	72.6	49.7	2
4/23/2019	8:20:51	834	72.6	49.3	1.8
4/23/2019	8:21:51	826	72.6	49.3	1.8
4/23/2019	8:22:51	818	72.7	49.4	1.8
4/23/2019	8:23:51	814	72.7	49.6	1.9
4/23/2019	8:24:51	803	72.7	49.9	1.8
4/23/2019	8:25:51	797	72.7	50.2	1.7
4/23/2019	8:26:51	797	72.7	50.4	1.8
4/23/2019	8:27:51	798	72.6	50.5	1.7
4/23/2019	8:28:51	792	72.7	51	1.7
4/23/2019	8:29:51	791	72.7	51.1	1.8
4/23/2019	8:30:51	807	72.4	50.9	1.8
4/23/2019	8:31:51	824	72.2	50.3	1.8
4/23/2019	8:32:51	824	71.9	50.4	1.8
4/23/2019	8:33:51	826	71.7	50	1.8
4/23/2019	8:34:51	837	71.5	49.7	1.9
4/23/2019	8:35:51	846	71.1	48.6	1.8
4/23/2019	8:36:51	849	71.1	48.7	1.8
4/23/2019	8:37:51	845	71.2	49.2	1.7

4/23/2019	8:38:51	828	71.3	49.6	1.7
4/23/2019	8:39:51	806	71.4	49.9	1.7
4/23/2019	8:40:51	805	71.5	50	1.7
4/23/2019	8:41:51	805	71.7	49.8	1.7
4/23/2019	8:42:51	798	71.8	49.7	1.7
4/23/2019	8:43:51	793	71.9	49.6	1.7
4/23/2019	8:44:51	782	72	49.6	1.5
4/23/2019	8:45:51	771	72.1	49.6	1.6
4/23/2019	8:46:51	789	72.1	50.5	1.7
4/23/2019	8:47:51	784	72.2	50.2	1.6
4/23/2019	8:48:51	776	72.2	49.7	1.5
4/23/2019	8:49:51	778	72.2	49.1	1.5
4/23/2019	8:50:51	785	72.2	48.4	1.5
4/23/2019	8:51:51	788	72.2	47.8	1.6
4/23/2019	8:52:51	780	72.2	47.5	1.6
4/23/2019	8:53:51	769	72.2	47.8	1.5
4/23/2019	8:54:51	792	72.2	48.2	1.5
4/23/2019	8:55:51	795	72.2	48.6	1.5
4/23/2019	8:56:51	760	72.3	49	1.4
4/23/2019	8:57:51	748	72.4	49.2	1.4
4/23/2019	8:58:51	739	72.4	49.3	1.4
4/23/2019	8:59:51	746	72.4	50.2	1.3
4/23/2019	9:00:51	761	72.4	50.2	1.4
4/23/2019	9:01:51	763	72.4	51	1.6
4/23/2019	9:02:51	790	72.4	50.2	1.7
4/23/2019	9:03:51	785	72.3	49.5	1.6
4/23/2019	9:04:51	774	72	49	1.6
4/23/2019	9:05:51	767	71.7	48.6	1.6
4/23/2019	9:06:51	774	71.4	47.5	1.6
4/23/2019	9:07:51	776	71.1	47.2	1.5
4/23/2019	9:08:51	774	70.9	47.9	1.5
4/23/2019	9:09:51	773	71	48.6	1.5
4/23/2019	9:10:51	764	71.1	49.5	1.4
4/23/2019	9:11:51	754	71.3	49.9	1.5

4/23/2019	9:12:51	751	71.4	49.7	1.4
4/23/2019	9:13:51	746	71.5	49.4	1.4
4/23/2019	9:14:51	727	71.7	49.4	1.3
4/23/2019	9:15:51	725	71.8	49.3	1.3
4/23/2019	9:16:51	725	71.9	49.2	1.2
4/23/2019	9:17:51	720	72	49.1	1.2
4/23/2019	9:18:51	721	72.1	49.1	1.2
4/23/2019	9:19:51	717	72.1	49	1.2
4/23/2019	9:20:51	714	72.2	48.9	1.2
4/23/2019	9:21:51	703	72.2	48.8	1.1
4/23/2019	9:22:51	706	72.2	48.2	1.2
4/23/2019	9:23:51	706	72.1	48.1	1.1
4/23/2019	9:24:51	710	72.1	47.8	1.2
4/23/2019	9:25:51	707	72.2	47.5	1.2
4/23/2019	9:26:51	705	72.2	47.4	1.1
4/23/2019	9:27:51	703	72.2	47.5	1.1
4/23/2019	9:28:51	697	72.3	47.7	1
4/23/2019	9:29:51	702	72.2	48	1.2
4/23/2019	9:30:51	715	71.7	47.6	1.4
4/23/2019	9:31:51	724	71.3	47.6	1.4
4/23/2019	9:32:51	729	71.1	47.9	1.5
4/23/2019	9:33:51	733	70.9	49.3	1.4
4/23/2019	9:34:51	733	70.8	50.7	1.2
4/23/2019	9:35:51	734	70.8	51.1	1.4
4/23/2019	9:36:51	733	70.8	51.1	1.3
4/23/2019	9:37:51	726	70.9	51.5	1.4
4/23/2019	9:38:51	707	71.1	51.2	1.1
4/23/2019	9:39:51	701	71.2	49.9	1.1
4/23/2019	9:40:51	700	71.3	49	1
4/23/2019	9:41:51	695	71.4	48.7	1.1
4/23/2019	9:42:51	683	71.5	48.6	1
4/23/2019	9:43:51	684	71.7	48.5	1
4/23/2019	9:44:51	690	71.8	48.2	1
4/23/2019	9:45:51	689	71.9	48.2	1



4/23/2019	9:46:51	688	71.9	48.3	1
4/23/2019	9:47:51	684	72	48.4	1
4/23/2019	9:48:51	680	72.1	48.4	1
4/23/2019	9:49:51	677	72.2	48.7	1.1
4/23/2019	9:50:51	685	72.2	49.4	1
4/23/2019	9:51:51	697	72.1	49.1	1.1
4/23/2019	9:52:51	702	71.9	48.6	1.1
4/23/2019	9:53:51	709	71.7	48.5	1.2
4/23/2019	9:54:51	712	71.3	48	1.2
4/23/2019	9:55:51	722	71	47	1.3
4/23/2019	9:56:51	765	70.7	47.9	1.2
4/23/2019	9:57:51	768	70.6	50	1.1
4/23/2019	9:58:51	792	70.8	51.1	1.3
4/23/2019	9:59:51	782	71	51.1	1.2
4/23/2019	10:00:51	787	71.2	51.2	1.2
4/23/2019	10:01:51	766	71.4	50.6	1.2
4/23/2019	10:02:51	754	71.6	50.2	1.1
4/23/2019	10:03:51	722	71.7	49.8	1.1
4/23/2019	10:04:51	717	71.8	49.7	1.1
4/23/2019	10:05:51	829	71.9	49.8	1
4/23/2019	10:06:51	723	72	49.4	0.9
4/23/2019	10:07:51	706	72.2	49.6	0.9
4/23/2019	10:08:51	702	72.2	49.5	0.9
4/23/2019	10:09:51	700	72.3	49.6	1
4/23/2019	10:10:51	704	72.4	49.7	1
4/23/2019	10:11:51	705	72.5	49.8	0.9
4/23/2019	10:12:51	704	72.6	50	0.9
4/23/2019	10:13:51	711	72.7	49.8	0.9
4/23/2019	10:14:51	711	72.7	49.9	0.9
4/23/2019	10:15:51	708	72.8	49.8	0.9
4/23/2019	10:16:51	712	72.8	49.8	0.9
4/23/2019	10:17:51	722	72.8	49.8	0.9
4/23/2019	10:18:51	726	72.9	49.8	1
4/23/2019	10:19:51	716	72.9	50.1	0.9

4/23/2019	10:20:51	719	72.9	50.4	0.9
4/23/2019	10:21:51	766	73	51.2	1
4/23/2019	10:22:51	750	73	51.2	0.9
4/23/2019	10:23:51	768	73	50.9	1
4/23/2019	10:24:51	739	73	50.7	0.9
4/23/2019	10:25:51	724	73	50.8	0.9
4/23/2019	10:26:51	742	72.9	51.2	0.9
4/23/2019	10:27:51	774	72.9	51.4	1
4/23/2019	10:28:51	804	73.1	52	1.1
4/23/2019	10:29:51	867	73.4	52.8	1
4/23/2019	10:30:51	917	73.5	52.4	1.1
4/23/2019	10:31:51	909	73.6	52.1	1.3
4/23/2019	10:32:51	917	73.7	52.4	1.2
4/23/2019	10:33:51	919	73.8	52	1.2
4/23/2019	10:34:51	914	73.5	50.8	1.2
4/23/2019	10:35:51	936	73.1	50.7	1.5
4/23/2019	10:36:51	999	73	50.9	2
4/23/2019	10:37:51	1058	73.1	51.1	2.3
4/23/2019	10:38:51	1116	73	51.3	2.9
4/23/2019	10:39:51	1214	73.1	51.8	3.5
4/23/2019	10:40:51	1260	73	51.9	3.5
4/23/2019	10:41:51	1172	72.6	50.3	3.4
4/23/2019	10:42:51	1127	72.1	49.8	3
4/23/2019	10:43:51	1096	72.1	50	2.7
4/23/2019	10:44:51	1066	72.1	50.8	2.6
4/23/2019	10:45:51	1043	72.3	51.8	2.6
4/23/2019	10:46:51	1020	72.4	52	2.5
4/23/2019	10:47:51	970	72.6	51.2	2
4/23/2019	10:48:51	939	72.7	50.3	1.8
4/23/2019	10:49:51	942	72.8	50.5	2
4/23/2019	10:50:51	900	72.9	49.7	1.7
4/23/2019	10:51:51	864	73	48.9	1.6
4/23/2019	10:52:51	867	72.9	48.1	1.6
4/23/2019	10:53:51	861	72.8	47.3	1.6

4/23/2019	10:54:51	870	72.6	47.4	1.7
4/23/2019	10:55:51	869	72.5	46.6	1.7
4/23/2019	10:56:51	878	72.1	45.5	1.7
4/23/2019	10:57:51	881	71.5	46.3	1.7
4/23/2019	10:58:51	879	71.7	47.5	1.7
4/23/2019	10:59:51	877	71.5	48.9	1.7
4/23/2019	11:00:51	874	71.5	48.5	1.7
4/23/2019	11:01:51	870	71.4	48.1	1.7
4/23/2019	11:02:51	869	71.2	48.3	1.7
4/23/2019	11:03:51	868	71.2	49.9	1.7
4/23/2019	11:04:51	863	71.2	49.9	1.7
4/23/2019	11:05:51	862	71.1	49.6	1.7
4/23/2019	11:06:51	860	71.3	50	1.6
4/23/2019	11:07:51	854	71.4	49.4	1.6
4/23/2019	11:08:51	842	71.5	48.5	1.3
4/23/2019	11:09:51	840	71.7	47.4	1.3
4/23/2019	11:10:51	836	71.8	46.8	1.3
4/23/2019	11:11:51	833	72	46.4	1.2
4/23/2019	11:12:51	825	72.1	46.4	1.2
4/23/2019	11:13:51	827	72.1	47	1.3
4/23/2019	11:14:51	828	71.8	46.9	1.4
4/23/2019	11:15:51	839	71.5	46.2	1.6
4/23/2019	11:16:51	841	70.9	46.2	1.5
4/23/2019	11:17:51	841	71.1	47.3	1.5
4/23/2019	11:18:51	842	71.3	49	1.5
4/23/2019	11:19:51	840	71.1	49.7	1.5
4/23/2019	11:20:51	840	71.1	49.6	1.5
4/23/2019	11:21:51	838	71.2	49	1.5
4/23/2019	11:22:51	835	71.1	48.7	1.5
4/23/2019	11:23:51	833	71	48.1	1.5
4/23/2019	11:24:51	835	70.7	47.2	1.5
4/23/2019	11:25:51	842	70.4	46.9	1.5
4/23/2019	11:26:51	850	70.5	48.2	1.5
4/23/2019	11:27:51	917	70.7	50.4	1.4

4/23/2019	11:28:51	1081	71.2	52.2	1.5
4/23/2019	11:29:51	1040	71.6	51.3	1.5
4/23/2019	11:30:51	1016	72	51.1	1.6
4/23/2019	11:31:51	1009	72.3	50.8	1.5
4/23/2019	11:32:51	912	72.7	51.3	1
4/23/2019	11:33:51	960	72.9	50.6	1.4
4/23/2019	11:34:51	1009	72.9	49.2	1.3
4/23/2019	11:35:51	1011	72.6	48.2	1.3
4/23/2019	11:36:51	1020	72.3	47.5	1.2
4/23/2019	11:37:51	1039	72.2	46.9	1.3
4/23/2019	11:38:51	1102	71.9	49.1	1.1
4/23/2019	11:39:51	980	72	51.3	0.9
4/23/2019	11:40:51	964	72.1	51.7	1
4/23/2019	11:41:51	946	71.8	50.4	0.9
4/23/2019	11:42:51	917	71.6	50.2	0.9
4/23/2019	11:43:51	869	71.8	52.2	0.9
4/23/2019	11:44:51	875	71.9	53.2	0.9
4/23/2019	11:45:51	920	71.8	52.8	0.9
4/23/2019	11:46:51	912	71.5	51.6	0.9
4/23/2019	11:47:51	850	71.2	51.5	0.9
4/23/2019	11:48:51	798	71	52.3	0.8
4/23/2019	11:49:51	797	70.8	51.7	0.8
4/23/2019	11:50:51	767	70.7	51.3	0.8
4/23/2019	11:51:51	729	70.8	53.5	0.8
4/23/2019	11:52:51	702	71.1	55.7	0.8
4/23/2019	11:53:51	689	71.4	56.8	0.9
4/23/2019	11:54:51	788	71.4	54.1	2.4
4/23/2019	11:55:51	724	71.6	55.2	1.6
4/23/2019	11:56:51	719	71.7	55.3	1.7
4/23/2019	11:57:51	738	71.8	56	1.3
4/23/2019	11:58:51	776	71.8	54.7	1.4
4/23/2019	11:59:51	769	71.6	53.4	1.4
4/23/2019	12:00:51	775	71.4	52.6	1.1
4/23/2019	12:01:51	716	70.8	51.5	0.8

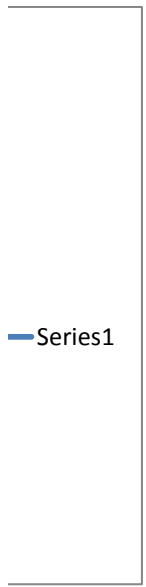
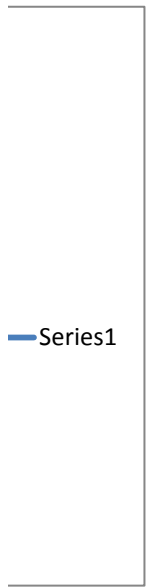
4/23/2019	12:02:51	638	70.3	52.3	0.7
4/23/2019	12:03:51	606	69.9	52.8	0.5
4/23/2019	12:04:51	604	69.9	53.2	0.5
4/23/2019	12:05:51	610	70.2	54.4	0.4
4/23/2019	12:06:51	681	70.7	56.8	0.5
4/23/2019	12:07:51	730	70.8	55.4	0.7
4/23/2019	12:08:51	762	70.6	54	0.8
4/23/2019	12:09:51	783	70.7	54.9	0.8
4/23/2019	12:10:51	802	71	56.3	0.8
4/23/2019	12:11:51	818	71.2	56.6	0.8
4/23/2019	12:12:51	821	71.3	55.1	0.8
4/23/2019	12:13:51	815	71.3	54.3	0.8
4/23/2019	12:14:51	804	71.1	53.1	0.9
4/23/2019	12:15:51	788	70.9	52.2	0.9
4/23/2019	12:16:51	774	70.5	51.2	0.8
4/23/2019	12:17:51	759	70.3	50.5	0.8
4/23/2019	12:18:51	750	70.2	50.7	0.9
4/23/2019	12:19:51	742	70.2	51.6	0.8
4/23/2019	12:20:51	732	70.4	52.9	0.8
4/23/2019	12:21:51	720	70.2	51.9	0.9
4/23/2019	12:22:51	709	70	51.3	0.8
4/23/2019	12:23:51	702	69.8	52.2	0.8
4/23/2019	12:24:51	696	70.1	52.6	0.8
4/23/2019	12:25:51	692	70.3	53.5	0.8
4/23/2019	12:26:51	690	70.3	52.5	0.9
4/23/2019	12:27:51	688	70.3	51.8	0.9
4/23/2019	12:28:51	687	70.3	51.4	0.9
4/23/2019	12:29:51	686	70.2	50.3	0.9
4/23/2019	12:30:51	682	70.1	50.2	0.9
4/23/2019	12:31:51	678	69.9	48.8	0.9
4/23/2019	12:32:51	675	69.7	49.5	0.9
4/23/2019	12:33:51	674	69.9	50.5	0.8
4/23/2019	12:34:51	671	70	51.5	0.9
4/23/2019	12:35:51	666	69.9	50.8	0.9

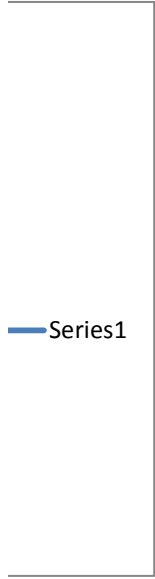
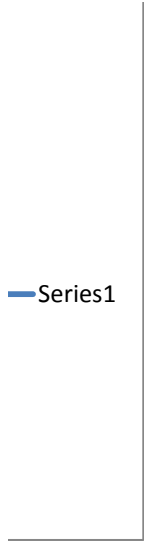
4/23/2019	12:36:51	662	69.8	50.6	0.9
4/23/2019	12:37:51	660	69.8	51	0.9
4/23/2019	12:38:51	660	70	52	0.9
4/23/2019	12:39:51	660	70.1	52.4	0.9
4/23/2019	12:40:51	662	70	51.6	0.9
4/23/2019	12:41:51	662	70	51	0.9
4/23/2019	12:42:51	664	70	50.5	0.9
4/23/2019	12:43:51	676	69.8	50	0.9
4/23/2019	12:44:51	674	69.7	49.3	0.9
4/23/2019	12:45:51	668	69.6	48.8	0.9
4/23/2019	12:46:51	666	69.6	49.7	0.9
4/23/2019	12:47:51	680	69.7	52	0.9
4/23/2019	12:48:51	697	69.8	52	0.9
4/23/2019	12:49:51	714	69.8	51.7	0.9
4/23/2019	12:50:51	728	69.9	52.5	0.9
4/23/2019	12:51:51	751	70.1	54.1	0.9
4/23/2019	12:52:51	764	70.3	54.8	0.9
4/23/2019	12:53:51	771	70.5	53.3	0.9
4/23/2019	12:54:51	765	70.6	53.1	0.9
4/23/2019	12:55:51	760	70.7	53	0.9
4/23/2019	12:56:51	752	70.8	52.4	0.9
4/23/2019	12:57:51	755	70.8	51.7	0.9
4/23/2019	12:58:51	748	70.7	51.2	0.9
4/23/2019	12:59:51	741	70.6	50	0.9
4/23/2019	13:00:51	748	70.5	50.3	0.9
4/23/2019	13:01:51	790	70.6	52.4	0.9
4/23/2019	13:02:51	875	70.9	54.9	0.9
4/23/2019	13:03:51	870	70.8	54.2	0.9
4/23/2019	13:04:51	880	70.7	53.1	0.9
4/23/2019	13:05:51	924	70.8	54.3	0.9
4/23/2019	13:06:51	936	70.9	55.4	0.9
4/23/2019	13:07:51	907	71.1	55.8	0.9
4/23/2019	13:08:51	892	71.1	54.7	0.9
4/23/2019	13:09:51	874	71	54	0.9

4/23/2019	13:10:51	867	71.1	53.9	0.9
4/23/2019	13:11:51	853	71.1	53.6	0.9
4/23/2019	13:12:51	875	71.1	53.7	0.9
4/23/2019	13:13:51	846	71	52.9	0.9
4/23/2019	13:14:51	807	70.9	52.5	0.9
4/23/2019	13:15:51	781	70.6	52.5	0.8
4/23/2019	13:16:51	773	70.8	52.6	0.9
4/23/2019	13:17:51	804	70.7	51.5	0.9
4/23/2019	13:18:51	811	70.5	51.9	0.9
4/23/2019	13:19:51	814	70.7	53.3	0.9
4/23/2019	13:20:51	804	70.8	53.5	0.9
4/23/2019	13:21:51	802	70.7	52.7	0.9
4/23/2019	13:22:51	801	70.6	52.3	0.9
4/23/2019	13:23:51	796	70.5	51.7	0.9
4/23/2019	13:24:51	798	70.4	52.7	0.9
4/23/2019	13:25:51	806	70.3	51.9	0.9
4/23/2019	13:26:51	807	70.3	51	0.9
4/23/2019	13:27:51	804	70.2	50.4	0.9
4/23/2019	13:28:51	806	70.1	49.7	0.9
4/23/2019	13:29:51	810	70.3	50.4	0.9
4/23/2019	13:30:51	816	70.4	51.9	0.9
4/23/2019	13:31:51	818	70.3	51.1	0.9
4/23/2019	13:32:51	822	70.1	50.8	0.9
4/23/2019	13:33:51	832	70.1	51	0.9
4/23/2019	13:34:51	828	70.1	50.5	0.9
4/23/2019	13:35:51	830	70.1	50.6	0.9
4/23/2019	13:36:51	867	70.2	50.5	1.1
4/23/2019	13:37:51	866	70.2	50	1.1
4/23/2019	13:38:51	852	70.1	49.6	1.1
4/23/2019	13:39:51	828	69.9	49.4	0.9
4/23/2019	13:40:51	800	69.9	49.9	0.9
4/23/2019	13:41:51	774	69.8	50.6	0.9
4/23/2019	13:42:51	762	69.9	50.6	0.9
4/23/2019	13:43:51	749	69.9	50.3	0.9



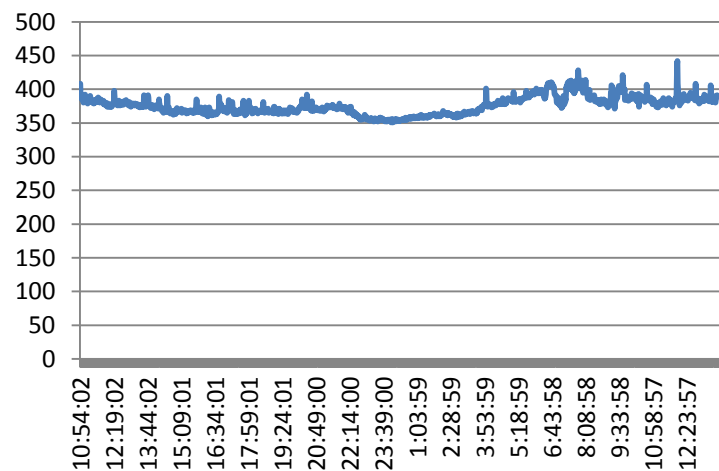
4/23/2019	13:44:51	745	69.7	49.5	0.9
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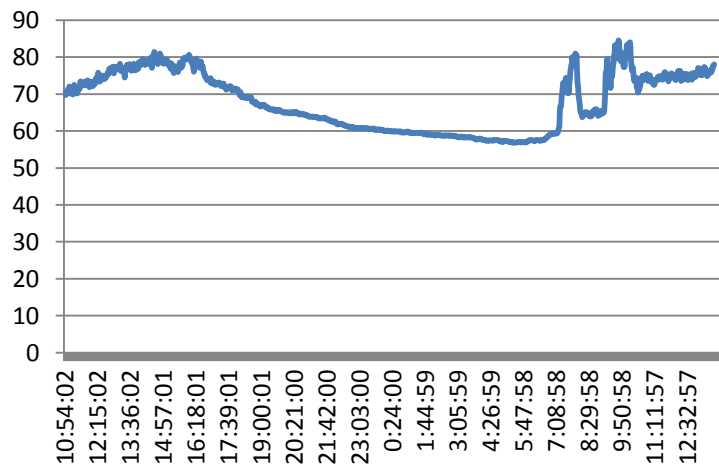


Date	Time	CO2	T	H	CO
Minutes		1608	1608	1608	1608
Minimum		351	56.8	37.6	0
Maximum		442	84.5	94.7	1.1
Average		375.4832	74.59073	48.27944	0.357863
4/22/2019	10:54:02	408	70.3	55.6	1.1
4/22/2019	10:55:02	389	70.2	55.9	1
4/22/2019	10:56:02	388	70.1	55.9	0.8
4/22/2019	10:57:02	386	69.8	56	0.8
4/22/2019	10:58:02	385	69.7	56.5	0.8
4/22/2019	10:59:02	386	70.1	55.4	0.7
4/22/2019	11:00:02	386	70.7	54.9	0.7
4/22/2019	11:01:02	384	70.1	54.6	0.7
4/22/2019	11:02:02	380	70.6	55.7	0.7
4/22/2019	11:03:02	389	71.2	54.5	0.7
4/22/2019	11:04:02	390	71.3	53.4	0.7
4/22/2019	11:05:02	385	70.6	52.8	0.7
4/22/2019	11:06:02	392	71.2	53.8	0.7
4/22/2019	11:07:02	387	72	53.2	0.7
4/22/2019	11:08:02	382	70.7	53.1	0.8
4/22/2019	11:09:02	381	70.1	53.4	0.8
4/22/2019	11:10:02	383	70.5	52.9	0.8
4/22/2019	11:11:02	383	70.8	53.7	0.8
4/22/2019	11:12:02	384	70.9	53.3	0.7
4/22/2019	11:13:02	379	70.8	53.2	0.7
4/22/2019	11:14:02	383	70.4	53.6	0.7
4/22/2019	11:15:02	383	70.4	53.5	0.7
4/22/2019	11:16:02	386	69.9	53.9	0.7
4/22/2019	11:17:02	385	71	54	0.7
4/22/2019	11:18:02	384	71.5	53.3	0.7
4/22/2019	11:19:02	390	72.5	52.3	0.7
4/22/2019	11:20:02	385	71.2	52.4	0.7
4/22/2019	11:21:02	381	70.4	53.9	0.7
4/22/2019	11:22:02	382	70.8	54.2	0.7

## Carbon Dioxide (CO2)

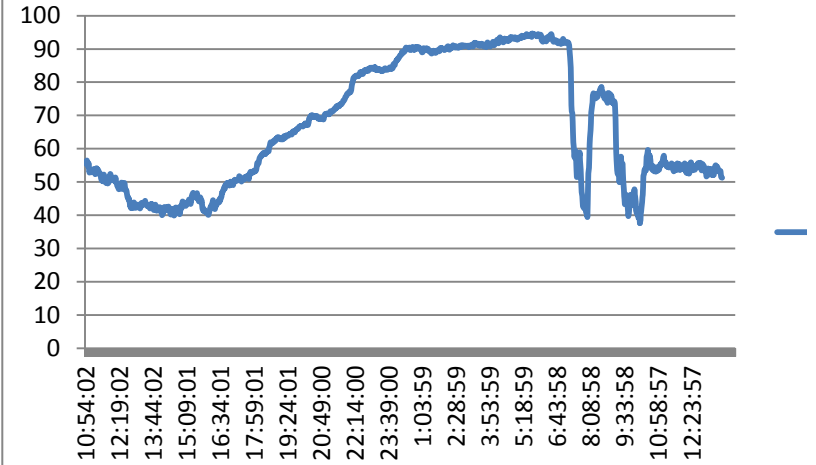


## Temperature (F)

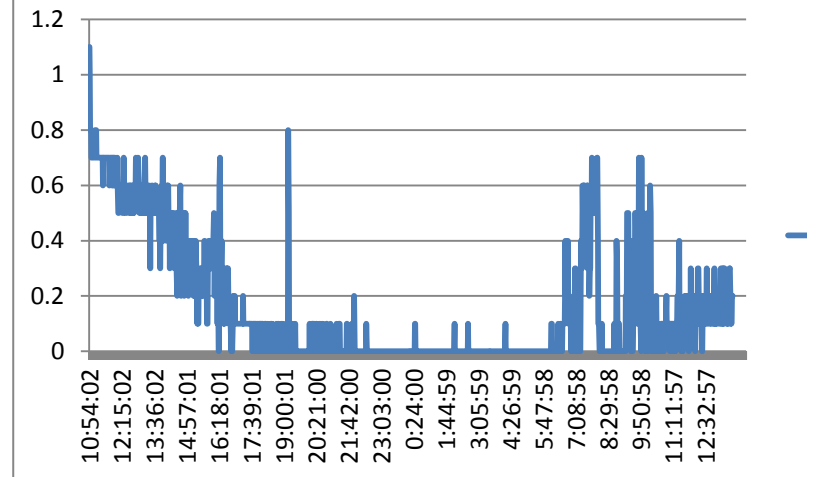


4/22/2019	11:23:02	383	70.8	53.5	0.7
4/22/2019	11:24:02	383	70.5	53.7	0.7
4/22/2019	11:25:02	380	70.2	53.5	0.7
4/22/2019	11:26:02	382	70.1	53.8	0.7
4/22/2019	11:27:02	381	70.2	53.4	0.7
4/22/2019	11:28:02	379	71.1	53.2	0.6
4/22/2019	11:29:02	380	71.6	52.7	0.7
4/22/2019	11:30:02	384	71.3	52.3	0.7
4/22/2019	11:31:02	383	71.6	52.3	0.7
4/22/2019	11:32:02	380	71.4	52.5	0.7
4/22/2019	11:33:02	382	72.4	52.3	0.7
4/22/2019	11:34:02	381	73.2	51.2	0.7
4/22/2019	11:35:02	384	73.4	50.5	0.7
4/22/2019	11:36:02	382	72.8	50.4	0.7
4/22/2019	11:37:02	386	72.7	50.4	0.7
4/22/2019	11:38:02	382	72.3	50.2	0.7
4/22/2019	11:39:02	388	72.9	50.8	0.7
4/22/2019	11:40:02	385	72.6	51.3	0.7
4/22/2019	11:41:02	384	72.4	52.2	0.7
4/22/2019	11:42:02	383	72.4	51.4	0.7
4/22/2019	11:43:02	380	72.4	51.1	0.7
4/22/2019	11:44:02	383	73.1	50.6	0.6
4/22/2019	11:45:02	384	73.3	50.2	0.6
4/22/2019	11:46:02	385	73.2	49.7	0.7
4/22/2019	11:47:02	382	72.6	50.5	0.7
4/22/2019	11:48:02	383	72.7	50.6	0.7
4/22/2019	11:49:02	381	72.7	49.9	0.7
4/22/2019	11:50:02	382	73.3	49.8	0.6
4/22/2019	11:51:02	381	73.7	49.5	0.7
4/22/2019	11:52:02	383	73.7	49.7	0.7
4/22/2019	11:53:02	378	73.6	49.8	0.6
4/22/2019	11:54:02	378	72.5	50.5	0.7
4/22/2019	11:55:02	379	72	51.6	0.7
4/22/2019	11:56:02	377	72.3	51.4	0.6

### Humidity (%)



### Carbon Monoxide (CO)



4/22/2019	11:57:02	377	71.9	52.4	0.6
4/22/2019	11:58:02	378	72.4	52.3	0.7
4/22/2019	11:59:02	380	72.4	51	0.6
4/22/2019	12:00:02	379	72.4	51.4	0.6
4/22/2019	12:01:02	377	72.9	51.3	0.6
4/22/2019	12:02:02	374	73.3	50.7	0.6
4/22/2019	12:03:02	375	72.7	50.6	0.6
4/22/2019	12:04:02	379	72.8	50.6	0.7
4/22/2019	12:05:02	377	72.1	50.7	0.6
4/22/2019	12:06:02	374	72.3	50.5	0.5
4/22/2019	12:07:02	376	73	50.7	0.5
4/22/2019	12:08:02	375	73.2	50.3	0.5
4/22/2019	12:09:02	375	73.1	50.4	0.6
4/22/2019	12:10:02	374	72.7	51.4	0.6
4/22/2019	12:11:02	374	73.2	51	0.6
4/22/2019	12:12:02	375	74	50.1	0.6
4/22/2019	12:13:02	374	74.2	49.4	0.6
4/22/2019	12:14:02	376	74.4	49.3	0.6
4/22/2019	12:15:02	376	74.5	48.8	0.6
4/22/2019	12:16:02	379	74.7	48.8	0.6
4/22/2019	12:17:02	378	75	48.6	0.5
4/22/2019	12:18:02	381	75.8	47.9	0.5
4/22/2019	12:19:02	380	75.1	47.8	0.6
4/22/2019	12:20:02	398	74.2	48.7	0.7
4/22/2019	12:21:02	384	73.3	48.3	0.6
4/22/2019	12:22:02	382	73.4	49.3	0.6
4/22/2019	12:23:02	382	73.9	49.4	0.6
4/22/2019	12:24:02	382	74.2	49.1	0.5
4/22/2019	12:25:02	380	73.8	49.8	0.5
4/22/2019	12:26:02	378	74.8	48.9	0.5
4/22/2019	12:27:02	377	75	47.9	0.5
4/22/2019	12:28:02	381	74.2	48.2	0.6
4/22/2019	12:29:02	376	74.2	49.2	0.6
4/22/2019	12:30:02	379	75	48.3	0.6

4/22/2019	12:31:02	383	74.6	48.2	0.6
4/22/2019	12:32:02	383	74.4	48.6	0.6
4/22/2019	12:33:02	378	74	49.7	0.6
4/22/2019	12:34:02	376	74.9	48.5	0.5
4/22/2019	12:35:02	381	74.8	47.5	0.6
4/22/2019	12:36:02	378	74.3	47.7	0.6
4/22/2019	12:37:02	377	74.5	47.7	0.5
4/22/2019	12:38:02	381	74.7	47.2	0.6
4/22/2019	12:39:02	380	75.1	46.5	0.5
4/22/2019	12:40:02	381	75.3	45.9	0.5
4/22/2019	12:41:02	380	75.3	45.4	0.6
4/22/2019	12:42:02	377	75.8	45.4	0.5
4/22/2019	12:43:02	379	75.3	44.7	0.5
4/22/2019	12:44:02	382	75.5	45	0.6
4/22/2019	12:45:02	380	76.7	44.7	0.5
4/22/2019	12:46:02	379	76.4	43.6	0.6
4/22/2019	12:47:02	381	76.2	42.8	0.6
4/22/2019	12:48:02	382	76.7	43	0.6
4/22/2019	12:49:02	382	77.1	42.3	0.6
4/22/2019	12:50:02	384	76.9	42.1	0.7
4/22/2019	12:51:02	379	76	42.6	0.6
4/22/2019	12:52:02	379	76.6	43.1	0.6
4/22/2019	12:53:02	381	77.3	42.9	0.6
4/22/2019	12:54:02	380	76.7	42.1	0.6
4/22/2019	12:55:02	379	76.1	42.6	0.6
4/22/2019	12:56:02	376	75.8	43.3	0.7
4/22/2019	12:57:02	377	75.6	43.9	0.6
4/22/2019	12:58:02	381	76.3	43.7	0.6
4/22/2019	12:59:02	380	76.6	43.4	0.5
4/22/2019	13:00:02	379	77.4	42.9	0.6
4/22/2019	13:01:02	377	76.9	42.2	0.6
4/22/2019	13:02:02	374	76.5	42.2	0.6
4/22/2019	13:03:02	377	77.3	42.9	0.5
4/22/2019	13:04:02	376	76.7	42.4	0.6



4/22/2019	13:05:02	376	76.8	42.7	0.6
4/22/2019	13:06:02	379	77	43.2	0.5
4/22/2019	13:07:02	377	76.8	42.8	0.6
4/22/2019	13:08:02	379	77	43.1	0.6
4/22/2019	13:09:02	377	76.9	43	0.6
4/22/2019	13:10:02	377	77.1	42.6	0.5
4/22/2019	13:11:02	376	77.8	42.2	0.5
4/22/2019	13:12:02	379	78.2	42	0.6
4/22/2019	13:13:02	379	77.2	42.2	0.7
4/22/2019	13:14:02	377	76.2	42.9	0.6
4/22/2019	13:15:02	376	76.5	43.6	0.6
4/22/2019	13:16:02	376	76.8	43.7	0.5
4/22/2019	13:17:02	377	77	43.8	0.6
4/22/2019	13:18:02	377	77.1	43.3	0.6
4/22/2019	13:19:02	378	76.5	43	0.6
4/22/2019	13:20:02	376	76.3	43.8	0.5
4/22/2019	13:21:02	374	76.9	43.4	0.5
4/22/2019	13:22:02	375	76.2	43.7	0.5
4/22/2019	13:23:02	375	75.3	43.5	0.5
4/22/2019	13:24:02	373	74.5	44.1	0.6
4/22/2019	13:25:02	376	75.7	44.3	0.5
4/22/2019	13:26:02	377	76.7	43.8	0.3
4/22/2019	13:27:02	375	77.1	43.3	0.5
4/22/2019	13:28:02	377	77.4	43.4	0.5
4/22/2019	13:29:02	374	77.9	43	0.5
4/22/2019	13:30:02	377	77.8	42.9	0.6
4/22/2019	13:31:02	377	76.7	42.7	0.6
4/22/2019	13:32:02	374	76.9	42.9	0.5
4/22/2019	13:33:02	375	77	43.1	0.5
4/22/2019	13:34:02	374	77.2	43.1	0.5
4/22/2019	13:35:02	391	77.7	43.1	0.5
4/22/2019	13:36:02	390	78.1	42.5	0.5
4/22/2019	13:37:02	381	77.6	42	0.6
4/22/2019	13:38:02	382	76.8	42.6	0.6

4/22/2019	13:39:02	379	76.6	43.2	0.5
4/22/2019	13:40:02	374	76.3	43.4	0.6
4/22/2019	13:41:02	376	76.7	43.1	0.5
4/22/2019	13:42:02	379	76.6	43.4	0.5
4/22/2019	13:43:02	380	77.6	43.3	0.5
4/22/2019	13:44:02	376	77.5	42.7	0.5
4/22/2019	13:45:02	391	78.1	42.7	0.5
4/22/2019	13:46:02	388	78.2	42.5	0.5
4/22/2019	13:47:02	378	76.9	41.6	0.5
4/22/2019	13:48:02	377	76.9	42.5	0.5
4/22/2019	13:49:02	377	76.8	43	0.4
4/22/2019	13:50:02	374	76.4	43.1	0.5
4/22/2019	13:51:02	376	77	43.2	0.3
4/22/2019	13:52:02	372	77.6	42.5	0.4
4/22/2019	13:53:02	374	77.6	42.1	0.5
4/22/2019	13:54:02	376	77.6	41.4	0.5
4/22/2019	13:55:02	377	77.8	41.7	0.6
4/22/2019	13:56:02	375	77.9	41.9	0.5
4/22/2019	13:57:02	372	76.8	42.2	0.7
4/22/2019	13:58:02	374	78	42.3	0.5
4/22/2019	13:59:02	375	78.6	41.9	0.4
4/22/2019	14:00:02	375	78.2	41.5	0.5
4/22/2019	14:01:02	370	77.7	41.9	0.5
4/22/2019	14:02:02	376	78	42.4	0.5
4/22/2019	14:03:02	374	78.1	41.6	0.5
4/22/2019	14:04:02	375	78.7	41.3	0.5
4/22/2019	14:05:02	373	78	41.5	0.5
4/22/2019	14:06:02	375	78.6	40.9	0.6
4/22/2019	14:07:02	376	79.1	40.7	0.4
4/22/2019	14:08:02	374	79.5	40	0.5
4/22/2019	14:09:02	377	79.4	40.2	0.6
4/22/2019	14:10:02	372	79	40.5	0.5
4/22/2019	14:11:02	371	78	40.9	0.6
4/22/2019	14:12:02	372	78.2	41.6	0.5

4/22/2019	14:13:02	385	78	41.9	0.4
4/22/2019	14:14:02	379	77.9	42.4	0.5
4/22/2019	14:15:02	373	78.9	42.3	0.3
4/22/2019	14:16:02	374	78.6	42	0.4
4/22/2019	14:17:02	372	78.9	41.7	0.5
4/22/2019	14:18:02	372	78.6	41.7	0.5
4/22/2019	14:19:02	371	78.7	42.4	0.5
4/22/2019	14:20:02	368	78.6	42.1	0.5
4/22/2019	14:21:02	371	79.1	41.6	0.4
4/22/2019	14:22:02	372	78.3	41.7	0.5
4/22/2019	14:23:02	367	78.1	42.2	0.5
4/22/2019	14:24:02	365	78.1	42.6	0.4
4/22/2019	14:25:02	369	78.1	42.2	0.4
4/22/2019	14:26:02	368	78.4	41.7	0.3
4/22/2019	14:27:02	367	79	41.3	0.4
4/22/2019	14:28:02	369	79.8	40.9	0.4
4/22/2019	14:29:02	369	79.2	40.3	0.4
4/22/2019	14:30:02	367	77.9	40.2	0.5
4/22/2019	14:31:02	366	77.1	40.9	0.5
4/22/2019	14:32:02	369	78.5	41.9	0.3
4/22/2019	14:33:02	369	80.2	41.7	0.2
4/22/2019	14:34:02	390	80.4	41.3	0.3
4/22/2019	14:35:02	377	79.7	41.4	0.4
4/22/2019	14:36:02	370	80.5	41.4	0.5
4/22/2019	14:37:01	372	81.4	40.4	0.5
4/22/2019	14:38:01	373	81.1	39.9	0.5
4/22/2019	14:39:01	369	80.8	39.9	0.5
4/22/2019	14:40:01	368	79.8	40.5	0.5
4/22/2019	14:41:01	364	78.7	41.9	0.6
4/22/2019	14:42:01	364	79.3	42.3	0.3
4/22/2019	14:43:01	367	79.6	42.3	0.2
4/22/2019	14:44:01	367	79.2	41.2	0.3
4/22/2019	14:45:01	365	78.1	41.4	0.5
4/22/2019	14:46:01	367	79.4	41.6	0.4

4/22/2019	14:47:01	367	79.9	41.6	0.4
4/22/2019	14:48:01	365	79.4	42.1	0.5
4/22/2019	14:49:01	362	79.7	42.3	0.3
4/22/2019	14:50:01	366	80.4	41.3	0.3
4/22/2019	14:51:01	368	81	40.8	0.2
4/22/2019	14:52:01	368	80.6	40.3	0.5
4/22/2019	14:53:01	369	80.4	40.6	0.4
4/22/2019	14:54:01	367	78.9	41.8	0.5
4/22/2019	14:55:01	363	78.8	42.7	0.4
4/22/2019	14:56:01	366	79.4	42.4	0.3
4/22/2019	14:57:01	367	78.4	42.1	0.4
4/22/2019	14:58:01	372	78.9	43.4	0.4
4/22/2019	14:59:01	366	78.5	43.6	0.4
4/22/2019	15:00:01	369	78.2	44.2	0.4
4/22/2019	15:01:01	367	78.6	44	0.2
4/22/2019	15:02:01	368	78.9	43.9	0.3
4/22/2019	15:03:01	367	79.2	43.6	0.3
4/22/2019	15:04:01	367	78.5	43.4	0.3
4/22/2019	15:05:01	368	78.5	43.5	0.4
4/22/2019	15:06:01	369	79	43.6	0.3
4/22/2019	15:07:01	369	79.2	43.1	0.3
4/22/2019	15:08:01	370	79.3	42.8	0.4
4/22/2019	15:09:01	371	78.7	43.2	0.3
4/22/2019	15:10:01	367	78.6	43.4	0.4
4/22/2019	15:11:01	365	78.1	43.7	0.3
4/22/2019	15:12:01	367	77.8	44	0.4
4/22/2019	15:13:01	367	78.4	44	0.3
4/22/2019	15:14:01	368	78.3	43.6	0.2
4/22/2019	15:15:01	369	77.8	44	0.3
4/22/2019	15:16:01	368	77.6	44.7	0.4
4/22/2019	15:17:01	368	76.9	44.1	0.2
4/22/2019	15:18:01	368	78.4	44.2	0.2
4/22/2019	15:19:01	369	78.3	43.7	0.2
4/22/2019	15:20:01	369	77.9	43.4	0.4

4/22/2019	15:21:01	367	77.2	43.9	0.3
4/22/2019	15:22:01	364	76.6	44.8	0.2
4/22/2019	15:23:01	365	76.4	46	0.3
4/22/2019	15:24:01	368	76.6	46.1	0.1
4/22/2019	15:25:01	367	75.7	46.4	0.3
4/22/2019	15:26:01	368	76.4	46.8	0.1
4/22/2019	15:27:01	365	76.5	46.3	0.2
4/22/2019	15:28:01	368	77	45.9	0.2
4/22/2019	15:29:01	368	77.5	45.4	0.2
4/22/2019	15:30:01	367	76.9	45.5	0.2
4/22/2019	15:31:01	367	76.6	45.7	0.3
4/22/2019	15:32:01	369	76.6	45.7	0.3
4/22/2019	15:33:01	369	77.2	45.6	0.2
4/22/2019	15:34:01	368	76.2	45.8	0.3
4/22/2019	15:35:01	367	75.9	45.9	0.3
4/22/2019	15:36:01	368	76.3	46.7	0.2
4/22/2019	15:37:01	368	77.3	45.7	0.2
4/22/2019	15:38:01	365	77.2	44.9	0.2
4/22/2019	15:39:01	367	78	45.3	0.2
4/22/2019	15:40:01	369	78.5	44.4	0.2
4/22/2019	15:41:01	365	77.6	44.2	0.4
4/22/2019	15:42:01	365	77.4	44.3	0.4
4/22/2019	15:43:01	366	77.1	44.8	0.3
4/22/2019	15:44:01	366	77.3	45.4	0.3
4/22/2019	15:45:01	369	77.7	45.2	0.2
4/22/2019	15:46:01	368	77.6	44.5	0.2
4/22/2019	15:47:01	385	77.8	44.2	0.3
4/22/2019	15:48:01	384	79.2	44.3	0.1
4/22/2019	15:49:01	374	79.5	43	0.1
4/22/2019	15:50:01	369	79.7	42	0.3
4/22/2019	15:51:01	368	79.6	41.5	0.3
4/22/2019	15:52:01	366	79.8	41.9	0.4
4/22/2019	15:53:01	368	79.8	41.9	0.4
4/22/2019	15:54:01	367	79.8	41.2	0.4

4/22/2019	15:55:01	370	79.3	41.3	0.3
4/22/2019	15:56:01	367	79.4	41.4	0.4
4/22/2019	15:57:01	367	79.6	41.2	0.3
4/22/2019	15:58:01	370	79.4	41	0.3
4/22/2019	15:59:01	373	80.1	41.1	0.3
4/22/2019	16:00:01	371	80	40.9	0.3
4/22/2019	16:01:01	367	79.9	40.9	0.3
4/22/2019	16:02:01	364	79.7	41	0.3
4/22/2019	16:03:01	369	80.6	40.5	0.3
4/22/2019	16:04:01	368	80.3	40.1	0.4
4/22/2019	16:05:01	367	80.1	40.1	0.5
4/22/2019	16:06:01	364	79.6	40.5	0.4
4/22/2019	16:07:01	363	79	40.9	0.2
4/22/2019	16:08:01	363	79.4	41.7	0.3
4/22/2019	16:09:01	373	78.8	42.1	0.3
4/22/2019	16:10:01	369	78.4	42.3	0.3
4/22/2019	16:11:01	367	78.1	42.6	0.2
4/22/2019	16:12:01	363	77.9	42.3	0.3
4/22/2019	16:13:01	361	77	43.3	0.3
4/22/2019	16:14:01	364	76.8	43.4	0.1
4/22/2019	16:15:01	362	76	43.6	0.3
4/22/2019	16:16:01	360	76.9	44.5	0.2
4/22/2019	16:17:01	362	78.2	43.8	0
4/22/2019	16:18:01	365	78.7	42.9	0.3
4/22/2019	16:19:01	364	79	42.4	0.6
4/22/2019	16:20:01	373	79.6	42.3	0.7
4/22/2019	16:21:01	368	79.6	41.8	0.3
4/22/2019	16:22:01	366	79.2	42.4	0.3
4/22/2019	16:23:01	366	78.8	42.6	0.3
4/22/2019	16:24:01	367	78.2	43.2	0.4
4/22/2019	16:25:01	362	77.6	43.1	0.3
4/22/2019	16:26:01	361	78.3	43.4	0.3
4/22/2019	16:27:01	363	77.9	43.8	0.2
4/22/2019	16:28:01	362	77.7	43.9	0.3

4/22/2019	16:29:01	365	78.2	43.9	0.1
4/22/2019	16:30:01	364	77.1	44.1	0.2
4/22/2019	16:31:01	366	77.9	44.4	0.1
4/22/2019	16:32:01	365	78.8	43.9	0.1
4/22/2019	16:33:01	362	78.2	44.2	0.2
4/22/2019	16:34:01	362	77.6	45	0.3
4/22/2019	16:35:01	363	77.6	44.6	0.3
4/22/2019	16:36:01	363	77.6	45.2	0.3
4/22/2019	16:37:01	365	77.4	45.4	0.3
4/22/2019	16:38:01	364	76.4	45.9	0.2
4/22/2019	16:39:01	363	75.8	46.8	0.3
4/22/2019	16:40:01	365	75.6	46.8	0.3
4/22/2019	16:41:01	367	75.6	47.1	0.2
4/22/2019	16:42:01	366	74.7	47.3	0.2
4/22/2019	16:43:01	369	74.9	47.8	0.1
4/22/2019	16:44:01	372	74.7	47.9	0.1
4/22/2019	16:45:01	389	74.3	48.4	0.1
4/22/2019	16:46:01	371	74.1	48	0.1
4/22/2019	16:47:01	371	73.8	49	0.1
4/22/2019	16:48:01	379	74	49.2	0
4/22/2019	16:49:01	377	73.9	48.9	0.1
4/22/2019	16:50:01	377	73.9	49.2	0.1
4/22/2019	16:51:01	371	74.1	49.3	0
4/22/2019	16:52:01	371	73.9	49.7	0.1
4/22/2019	16:53:01	370	73.5	49.5	0.2
4/22/2019	16:54:01	368	73.7	49.6	0.1
4/22/2019	16:55:01	370	74.1	49.5	0.1
4/22/2019	16:56:01	372	74.3	49.7	0.1
4/22/2019	16:57:01	369	73	49	0.2
4/22/2019	16:58:01	367	73.6	49.3	0.1
4/22/2019	16:59:01	369	73.4	49	0.1
4/22/2019	17:00:01	368	73.5	49.8	0.1
4/22/2019	17:01:01	370	73.4	50.1	0.1
4/22/2019	17:02:01	370	72.7	49.5	0.1



4/22/2019	17:03:01	372	73.1	50	0.1
4/22/2019	17:04:01	370	73.4	49.9	0.1
4/22/2019	17:05:01	365	73.2	49.6	0.1
4/22/2019	17:06:01	369	73	49.2	0.1
4/22/2019	17:07:01	368	72.7	49.1	0.1
4/22/2019	17:08:01	370	72.5	49.6	0.1
4/22/2019	17:09:01	384	72.5	50.2	0.1
4/22/2019	17:10:01	382	72.7	50.2	0.1
4/22/2019	17:11:01	373	72.9	50.7	0.1
4/22/2019	17:12:01	374	73	50.5	0.1
4/22/2019	17:13:01	374	73.1	50.4	0.1
4/22/2019	17:14:01	369	73	50.4	0.1
4/22/2019	17:15:01	370	73.1	50.3	0.1
4/22/2019	17:16:01	368	73.1	50.3	0.1
4/22/2019	17:17:01	379	72.9	50.4	0.1
4/22/2019	17:18:01	381	73.1	50.6	0.2
4/22/2019	17:19:01	369	72.6	50.6	0.1
4/22/2019	17:20:01	368	72.5	50.6	0.1
4/22/2019	17:21:01	365	72.4	50.8	0.1
4/22/2019	17:22:01	363	72.1	51.3	0.1
4/22/2019	17:23:01	367	72.1	51.8	0.1
4/22/2019	17:24:01	368	72.5	51.6	0.1
4/22/2019	17:25:01	364	72.4	51.4	0.1
4/22/2019	17:26:01	367	72.7	51	0.1
4/22/2019	17:27:01	369	72.8	50.6	0.1
4/22/2019	17:28:01	368	72.8	50.1	0.1
4/22/2019	17:29:01	363	72.2	50.5	0.1
4/22/2019	17:30:01	367	72.2	50.6	0.1
4/22/2019	17:31:01	364	71.8	50.6	0.1
4/22/2019	17:32:01	365	71.7	50.9	0.1
4/22/2019	17:33:01	364	71.8	51.1	0.1
4/22/2019	17:34:01	367	71.7	50.8	0.1
4/22/2019	17:35:01	364	71.2	50.8	0.1
4/22/2019	17:36:01	369	71.6	51.5	0.1

4/22/2019	17:37:01	369	71.5	51.3	0.1
4/22/2019	17:38:01	370	71.5	51	0.1
4/22/2019	17:39:01	369	71.5	51.3	0.1
4/22/2019	17:40:01	366	71.6	51.4	0.1
4/22/2019	17:41:01	365	71.9	51.6	0
4/22/2019	17:42:01	367	72	51.8	0
4/22/2019	17:43:01	370	72	51.8	0.1
4/22/2019	17:44:01	366	72	51.6	0.1
4/22/2019	17:45:01	381	72	52	0.1
4/22/2019	17:46:01	383	72.1	51.4	0.1
4/22/2019	17:47:01	368	71.4	50.9	0.1
4/22/2019	17:48:01	367	71.4	51.7	0.1
4/22/2019	17:49:01	363	71	52.2	0.1
4/22/2019	17:50:01	361	70.9	52.8	0
4/22/2019	17:51:01	362	71.1	53	0
4/22/2019	17:52:01	364	71.1	53.1	0.1
4/22/2019	17:53:01	363	71.3	52.9	0.1
4/22/2019	17:54:01	365	71.3	52.7	0.1
4/22/2019	17:55:01	366	71.4	52.7	0
4/22/2019	17:56:01	368	71.5	53	0
4/22/2019	17:57:01	368	71.3	53	0.1
4/22/2019	17:58:01	369	71.1	52.9	0.1
4/22/2019	17:59:01	376	71.3	53	0.1
4/22/2019	18:00:01	383	71.3	53.4	0.1
4/22/2019	18:01:01	371	71.3	53.2	0.1
4/22/2019	18:02:01	370	71.1	53.5	0.1
4/22/2019	18:03:01	372	71.3	53.2	0
4/22/2019	18:04:01	373	71.1	53.3	0.1
4/22/2019	18:05:01	371	70.5	53.6	0.1
4/22/2019	18:06:01	368	70.4	54.2	0.1
4/22/2019	18:07:01	367	70	54.7	0.1
4/22/2019	18:08:01	364	69.7	55.6	0
4/22/2019	18:09:01	367	70.1	55.8	0
4/22/2019	18:10:01	368	70.5	55.7	0

4/22/2019	18:11:01	365	70	55.5	0
4/22/2019	18:12:01	370	69.8	55.9	0.1
4/22/2019	18:13:01	366	69.2	56.6	0
4/22/2019	18:14:01	366	69.3	57.3	0.1
4/22/2019	18:15:01	368	69.2	57.4	0.1
4/22/2019	18:16:01	369	69.2	57.6	0
4/22/2019	18:17:01	371	69.2	57.6	0
4/22/2019	18:18:01	368	69.2	57.9	0
4/22/2019	18:19:01	369	69.2	57.8	0
4/22/2019	18:20:01	367	69.1	58.1	0.1
4/22/2019	18:21:01	366	68.9	58.4	0
4/22/2019	18:22:01	364	69	58.5	0
4/22/2019	18:23:01	366	69	58.5	0
4/22/2019	18:24:01	366	69.2	58.8	0
4/22/2019	18:25:01	366	69.2	58.8	0
4/22/2019	18:26:01	367	69.1	58.4	0
4/22/2019	18:27:01	366	69	58.6	0.1
4/22/2019	18:28:01	369	69.3	58.6	0
4/22/2019	18:29:01	369	69.1	58.4	0.1
4/22/2019	18:30:01	368	69	58.7	0
4/22/2019	18:31:01	367	68.9	58.9	0.1
4/22/2019	18:32:01	366	69	59.3	0
4/22/2019	18:33:01	366	69	59.2	0
4/22/2019	18:34:01	366	68.9	59.1	0
4/22/2019	18:35:01	369	68.9	59.2	0
4/22/2019	18:36:01	381	69.1	59.5	0
4/22/2019	18:37:01	367	68.6	59.3	0
4/22/2019	18:38:01	367	68.3	60.2	0
4/22/2019	18:39:01	365	67.9	60.7	0
4/22/2019	18:40:01	366	67.8	61.2	0
4/22/2019	18:41:01	367	67.8	61.7	0.1
4/22/2019	18:42:01	371	67.8	62	0
4/22/2019	18:43:01	367	68	61.8	0
4/22/2019	18:44:01	367	68	61.8	0

4/22/2019	18:45:01	366	67.6	61.6	0.1
4/22/2019	18:46:01	370	67.4	61.7	0.1
4/22/2019	18:47:01	370	67.6	62.1	0
4/22/2019	18:48:01	371	67.8	62	0
4/22/2019	18:49:01	369	67.5	61.9	0
4/22/2019	18:50:01	365	67.1	62.4	0
4/22/2019	18:51:01	366	67.2	62.5	0
4/22/2019	18:52:01	367	67.2	62.3	0
4/22/2019	18:53:01	367	67.3	62.3	0
4/22/2019	18:54:01	366	67.2	62.3	0.1
4/22/2019	18:55:01	367	67	62.7	0
4/22/2019	18:56:01	368	67	63.1	0.1
4/22/2019	18:57:01	367	67	62.9	0
4/22/2019	18:58:01	366	66.9	63.1	0
4/22/2019	18:59:01	365	66.6	63.4	0
4/22/2019	19:00:01	365	66.6	63.4	0
4/22/2019	19:01:01	366	66.9	63.5	0
4/22/2019	19:02:01	364	67	63.3	0
4/22/2019	19:03:01	374	67	63.3	0
4/22/2019	19:04:01	374	67	63.2	0
4/22/2019	19:05:01	369	66.9	63.3	0.1
4/22/2019	19:06:01	367	67	63.1	0.1
4/22/2019	19:07:01	365	66.9	62.8	0.1
4/22/2019	19:08:01	369	67	63	0
4/22/2019	19:09:01	369	66.9	62.8	0
4/22/2019	19:10:01	365	66.9	62.8	0.1
4/22/2019	19:11:01	368	66.8	63	0.8
4/22/2019	19:12:01	370	66.6	62.8	0.5
4/22/2019	19:13:01	364	66.3	62.8	0
4/22/2019	19:14:01	363	66.3	63.1	0
4/22/2019	19:15:01	365	66.4	63.5	0.1
4/22/2019	19:16:01	371	66.4	63.8	0
4/22/2019	19:17:01	366	66.4	63.7	0
4/22/2019	19:18:01	370	66.3	63.5	0

4/22/2019	19:19:01	367	66.1	63.3	0
4/22/2019	19:20:01	367	65.9	63.9	0
4/22/2019	19:21:01	367	66	64	0
4/22/2019	19:22:01	364	65.9	64.1	0.1
4/22/2019	19:23:01	366	65.9	64	0
4/22/2019	19:24:01	364	65.9	63.9	0
4/22/2019	19:25:01	366	65.8	63.9	0
4/22/2019	19:26:01	366	65.7	63.9	0
4/22/2019	19:27:01	364	65.8	64	0
4/22/2019	19:28:01	369	65.8	64.2	0.1
4/22/2019	19:29:01	365	65.8	64.4	0
4/22/2019	19:30:01	365	65.8	64.4	0
4/22/2019	19:31:01	364	65.9	64.6	0
4/22/2019	19:32:00	365	65.8	64.5	0
4/22/2019	19:33:00	366	65.8	64.5	0
4/22/2019	19:34:00	369	65.8	64.4	0
4/22/2019	19:35:00	367	65.7	64.3	0
4/22/2019	19:36:00	366	65.4	64.6	0
4/22/2019	19:37:00	366	65.4	64.9	0
4/22/2019	19:38:00	363	65.5	65.2	0
4/22/2019	19:39:00	367	65.6	65.1	0
4/22/2019	19:40:00	366	65.7	65.2	0
4/22/2019	19:41:00	367	65.7	65	0
4/22/2019	19:42:00	366	65.6	65.1	0
4/22/2019	19:43:00	373	65.5	64.9	0
4/22/2019	19:44:00	370	65.5	65.2	0
4/22/2019	19:45:00	367	65.5	65.5	0
4/22/2019	19:46:00	368	65.6	65.7	0
4/22/2019	19:47:00	369	65.6	65.8	0
4/22/2019	19:48:00	372	65.6	65.8	0
4/22/2019	19:49:00	369	65.5	66	0
4/22/2019	19:50:00	370	65.4	65.9	0
4/22/2019	19:51:00	367	65.3	66	0
4/22/2019	19:52:00	370	65.2	66.1	0

4/22/2019	19:53:00	367	65.1	66.5	0
4/22/2019	19:54:00	366	65	66.6	0
4/22/2019	19:55:00	367	65	66.7	0
4/22/2019	19:56:00	368	64.9	66.7	0
4/22/2019	19:57:00	366	65	66.9	0
4/22/2019	19:58:00	366	65	66.8	0
4/22/2019	19:59:00	366	65	66.9	0
4/22/2019	20:00:00	366	65	66.8	0
4/22/2019	20:01:00	365	64.9	66.9	0
4/22/2019	20:02:00	366	65	66.8	0
4/22/2019	20:03:00	367	65	66.7	0
4/22/2019	20:04:00	367	64.9	66.8	0.1
4/22/2019	20:05:00	368	64.9	67	0
4/22/2019	20:06:00	372	65	67.2	0
4/22/2019	20:07:00	371	65	67.3	0
4/22/2019	20:08:00	373	65	67.3	0
4/22/2019	20:09:00	372	65	67.6	0
4/22/2019	20:10:00	375	64.9	67.6	0.1
4/22/2019	20:11:00	376	64.9	67.4	0.1
4/22/2019	20:12:00	375	64.8	67.2	0.1
4/22/2019	20:13:00	375	64.8	67.4	0.1
4/22/2019	20:14:00	385	65	67.6	0
4/22/2019	20:15:00	378	65.1	67.4	0
4/22/2019	20:16:00	377	65	67.2	0.1
4/22/2019	20:17:00	376	64.8	67.6	0
4/22/2019	20:18:00	372	64.8	67.9	0
4/22/2019	20:19:00	374	64.9	69	0
4/22/2019	20:20:00	383	65	69.1	0.1
4/22/2019	20:21:00	374	64.8	69.5	0.1
4/22/2019	20:22:00	374	65	69.7	0
4/22/2019	20:23:00	372	64.9	69.8	0
4/22/2019	20:24:00	373	64.9	69.8	0
4/22/2019	20:25:00	372	64.8	69.7	0
4/22/2019	20:26:00	392	65.2	70.1	0

4/22/2019	20:27:00	389	65.2	69.7	0
4/22/2019	20:28:00	375	64.8	69.7	0
4/22/2019	20:29:00	373	64.8	69.6	0.1
4/22/2019	20:30:00	378	64.8	69.9	0
4/22/2019	20:31:00	374	64.8	69.6	0
4/22/2019	20:32:00	376	64.8	69.7	0
4/22/2019	20:33:00	375	64.7	69.8	0.1
4/22/2019	20:34:00	373	64.7	69.8	0
4/22/2019	20:35:00	370	64.8	69.8	0
4/22/2019	20:36:00	369	64.6	69.6	0
4/22/2019	20:37:00	369	64.4	69.6	0.1
4/22/2019	20:38:00	368	64.5	69.6	0
4/22/2019	20:39:00	382	64.7	69.8	0
4/22/2019	20:40:00	376	64.6	69.4	0
4/22/2019	20:41:00	374	64.7	69.3	0
4/22/2019	20:42:00	371	64.6	69	0
4/22/2019	20:43:00	368	64.6	69	0
4/22/2019	20:44:00	372	64.7	69.3	0
4/22/2019	20:45:00	369	64.6	69.1	0
4/22/2019	20:46:00	371	64.4	68.9	0.1
4/22/2019	20:47:00	369	64.3	69	0.1
4/22/2019	20:48:00	370	64.3	69.1	0
4/22/2019	20:49:00	373	64.4	69.2	0
4/22/2019	20:50:00	371	64.4	69.2	0
4/22/2019	20:51:00	371	64.4	69.1	0
4/22/2019	20:52:00	370	64.3	69	0
4/22/2019	20:53:00	370	64.3	69.1	0
4/22/2019	20:54:00	369	64.2	69	0
4/22/2019	20:55:00	369	64.2	68.8	0
4/22/2019	20:56:00	369	64.2	68.9	0.1
4/22/2019	20:57:00	371	64.1	69.6	0
4/22/2019	20:58:00	369	64	70.1	0
4/22/2019	20:59:00	369	63.9	70.4	0
4/22/2019	21:00:00	368	63.9	70.4	0



4/22/2019	21:01:00	370	63.8	70.2	0
4/22/2019	21:02:00	369	63.8	70.4	0
4/22/2019	21:03:00	370	63.8	70.5	0
4/22/2019	21:04:00	370	63.8	70.6	0
4/22/2019	21:05:00	373	63.9	70.4	0
4/22/2019	21:06:00	371	63.9	70.4	0
4/22/2019	21:07:00	372	63.9	70.4	0
4/22/2019	21:08:00	371	63.9	70.5	0
4/22/2019	21:09:00	367	63.9	70.3	0
4/22/2019	21:10:00	369	63.9	70.5	0
4/22/2019	21:11:00	369	63.8	70.5	0.1
4/22/2019	21:12:00	369	63.7	70.9	0
4/22/2019	21:13:00	370	63.7	71.3	0
4/22/2019	21:14:00	370	63.8	71.3	0
4/22/2019	21:15:00	372	63.8	71.1	0
4/22/2019	21:16:00	374	63.8	71.2	0
4/22/2019	21:17:00	376	63.7	71.2	0.1
4/22/2019	21:18:00	375	63.7	71.2	0.1
4/22/2019	21:19:00	375	63.7	71.3	0.1
4/22/2019	21:20:00	374	63.7	71.4	0
4/22/2019	21:21:00	374	63.7	71.5	0
4/22/2019	21:22:00	373	63.5	71.9	0
4/22/2019	21:23:00	373	63.5	72.1	0
4/22/2019	21:24:00	373	63.4	72.2	0
4/22/2019	21:25:00	373	63.4	72	0
4/22/2019	21:26:00	374	63.5	72.3	0
4/22/2019	21:27:00	375	63.5	72.6	0
4/22/2019	21:28:00	376	63.5	72.3	0
4/22/2019	21:29:00	375	63.5	72.5	0
4/22/2019	21:30:00	374	63.4	72.9	0
4/22/2019	21:31:00	377	63.4	72.9	0
4/22/2019	21:32:00	372	63.4	72.9	0
4/22/2019	21:33:00	373	63.4	73	0
4/22/2019	21:34:00	374	63.4	72.7	0

4/22/2019	21:35:00	372	63.5	72.9	0
4/22/2019	21:36:00	374	63.5	72.9	0
4/22/2019	21:37:00	373	63.5	73.2	0.1
4/22/2019	21:38:00	374	63.6	73.4	0.1
4/22/2019	21:39:00	373	63.5	73.3	0
4/22/2019	21:40:00	374	63.4	73.4	0
4/22/2019	21:41:00	370	63.2	73.4	0
4/22/2019	21:42:00	370	63.1	73.7	0
4/22/2019	21:43:00	370	63.1	73.8	0
4/22/2019	21:44:00	372	63.1	74.1	0
4/22/2019	21:45:00	372	63.1	74.5	0
4/22/2019	21:46:00	374	63.1	74.5	0
4/22/2019	21:47:00	376	63.1	74.5	0
4/22/2019	21:48:00	379	63.1	74.8	0
4/22/2019	21:49:00	377	63.1	75	0
4/22/2019	21:50:00	372	62.8	75.3	0.1
4/22/2019	21:51:00	371	62.7	75.6	0.1
4/22/2019	21:52:00	372	62.7	75.7	0
4/22/2019	21:53:00	372	62.7	75.9	0
4/22/2019	21:54:00	373	62.6	76.3	0
4/22/2019	21:55:00	372	62.6	76.5	0.2
4/22/2019	21:56:00	374	62.6	76.5	0.1
4/22/2019	21:57:00	370	62.5	76.7	0
4/22/2019	21:58:00	373	62.6	76.7	0
4/22/2019	21:59:00	371	62.5	76.7	0
4/22/2019	22:00:00	372	62.4	77.1	0
4/22/2019	22:01:00	370	62.4	77.3	0
4/22/2019	22:02:00	370	62.5	77.3	0
4/22/2019	22:03:00	374	62.6	77	0
4/22/2019	22:04:00	372	62.5	77.1	0
4/22/2019	22:05:00	371	62.5	77.6	0
4/22/2019	22:06:00	369	62.2	78.5	0
4/22/2019	22:07:00	368	62	79.2	0
4/22/2019	22:08:00	368	62	79.6	0

4/22/2019	22:09:00	367	61.9	80.2	0
4/22/2019	22:10:00	365	61.8	80.9	0
4/22/2019	22:11:00	367	61.7	81.3	0
4/22/2019	22:12:00	367	61.8	81.3	0
4/22/2019	22:13:00	373	61.9	81.6	0
4/22/2019	22:14:00	371	61.9	81.8	0
4/22/2019	22:15:00	370	61.9	81.6	0
4/22/2019	22:16:00	374	61.9	81.7	0
4/22/2019	22:17:00	374	62	81.8	0
4/22/2019	22:18:00	365	61.9	81.8	0
4/22/2019	22:19:00	364	61.8	82.1	0
4/22/2019	22:20:00	364	61.8	82.1	0
4/22/2019	22:21:00	368	61.9	82	0
4/22/2019	22:22:00	367	61.9	81.8	0
4/22/2019	22:23:00	363	61.8	81.9	0
4/22/2019	22:24:00	361	61.7	81.9	0
4/22/2019	22:25:00	363	61.6	82.2	0
4/22/2019	22:26:00	366	61.6	82.3	0.1
4/22/2019	22:27:00	365	61.6	82.3	0
4/22/2019	22:28:00	361	61.4	83	0
4/22/2019	22:29:00	361	61.4	82.9	0
4/22/2019	22:30:00	360	61.4	82.9	0
4/22/2019	22:31:00	363	61.3	83	0
4/22/2019	22:32:00	360	61.3	82.9	0
4/22/2019	22:33:00	361	61.3	82.7	0
4/22/2019	22:34:00	361	61.3	82.5	0
4/22/2019	22:35:00	361	61.3	82.6	0
4/22/2019	22:36:00	358	61.3	82.7	0
4/22/2019	22:37:00	359	61.2	82.9	0
4/22/2019	22:38:00	358	61.1	83.5	0
4/22/2019	22:39:00	356	61	83.4	0
4/22/2019	22:40:00	355	61	83.6	0
4/22/2019	22:41:00	358	61	83.7	0
4/22/2019	22:42:00	355	61	83.7	0

4/22/2019	22:43:00	358	61.1	83.4	0
4/22/2019	22:44:00	356	61	83.4	0
4/22/2019	22:45:00	358	61	83.6	0
4/22/2019	22:46:00	355	60.9	83.9	0
4/22/2019	22:47:00	358	61.1	83.5	0
4/22/2019	22:48:00	358	61	83.4	0
4/22/2019	22:49:00	358	60.9	83.5	0
4/22/2019	22:50:00	358	60.9	83.8	0
4/22/2019	22:51:00	360	60.9	84	0
4/22/2019	22:52:00	362	60.7	84.2	0
4/22/2019	22:53:00	359	60.6	84.4	0
4/22/2019	22:54:00	358	60.7	84.3	0
4/22/2019	22:55:00	360	60.8	84.3	0
4/22/2019	22:56:00	355	60.8	84.3	0
4/22/2019	22:57:00	357	60.8	84.4	0
4/22/2019	22:58:00	358	60.9	84.4	0
4/22/2019	22:59:00	356	60.7	84	0
4/22/2019	23:00:00	355	60.7	84.1	0
4/22/2019	23:01:00	356	60.7	84.2	0
4/22/2019	23:02:00	355	60.6	84.2	0
4/22/2019	23:03:00	356	60.6	84.3	0
4/22/2019	23:04:00	354	60.6	84.6	0
4/22/2019	23:05:00	353	60.6	84.4	0
4/22/2019	23:06:00	357	60.8	84.5	0
4/22/2019	23:07:00	357	60.8	83.9	0
4/22/2019	23:08:00	355	60.8	83.6	0
4/22/2019	23:09:00	357	60.7	83.8	0
4/22/2019	23:10:00	357	60.9	83.8	0
4/22/2019	23:11:00	356	60.8	83.7	0
4/22/2019	23:12:00	354	60.7	83.9	0
4/22/2019	23:13:00	356	60.7	84	0
4/22/2019	23:14:00	356	60.7	83.9	0
4/22/2019	23:15:00	352	60.7	84	0
4/22/2019	23:16:00	354	60.7	84	0

4/22/2019	23:17:00	353	60.8	83.7	0
4/22/2019	23:18:00	357	60.8	83.7	0
4/22/2019	23:19:00	353	60.7	83.5	0
4/22/2019	23:20:00	356	60.7	83.6	0
4/22/2019	23:21:00	354	60.7	83.5	0
4/22/2019	23:22:00	354	60.7	83.3	0
4/22/2019	23:23:00	355	60.8	83.4	0
4/22/2019	23:24:00	356	60.7	83.4	0
4/22/2019	23:25:00	352	60.7	83.4	0
4/22/2019	23:26:00	354	60.7	83.6	0
4/22/2019	23:27:00	355	60.6	83.6	0
4/22/2019	23:28:00	354	60.5	83.9	0
4/22/2019	23:29:00	356	60.5	83.9	0
4/22/2019	23:30:00	358	60.4	84.2	0
4/22/2019	23:31:00	355	60.5	84.2	0
4/22/2019	23:32:00	358	60.5	84.1	0
4/22/2019	23:33:00	355	60.5	84.1	0
4/22/2019	23:34:00	355	60.5	83.8	0
4/22/2019	23:35:00	355	60.6	83.8	0
4/22/2019	23:36:00	357	60.7	83.7	0
4/22/2019	23:37:00	355	60.6	83.8	0
4/22/2019	23:38:00	356	60.6	84	0
4/22/2019	23:39:00	354	60.6	83.9	0
4/22/2019	23:40:00	355	60.6	84	0
4/22/2019	23:41:00	353	60.4	84.3	0
4/22/2019	23:42:00	354	60.3	84.5	0
4/22/2019	23:43:00	354	60.3	84.5	0
4/22/2019	23:44:00	352	60.4	84.3	0
4/22/2019	23:45:00	354	60.4	84.1	0
4/22/2019	23:46:00	354	60.4	84.2	0
4/22/2019	23:47:00	353	60.4	84.1	0
4/22/2019	23:48:00	352	60.4	84.3	0
4/22/2019	23:49:00	352	60.4	84.1	0
4/22/2019	23:50:00	353	60.4	84.3	0

4/22/2019	23:51:00	355	60.3	84.7	0
4/22/2019	23:52:00	354	60.3	85.4	0
4/22/2019	23:53:00	353	60.3	85.4	0
4/22/2019	23:54:00	354	60.3	85.1	0
4/22/2019	23:55:00	355	60.4	85.1	0
4/22/2019	23:56:00	354	60.4	85.7	0
4/22/2019	23:57:00	352	60.3	85.9	0
4/22/2019	23:58:00	354	60.3	86.3	0
4/22/2019	23:59:00	351	60.3	86.5	0
4/23/2019	0:00:00	354	60.2	86.7	0
4/23/2019	0:01:00	356	60.3	86.6	0
4/23/2019	0:02:00	352	60.2	87	0
4/23/2019	0:03:00	351	60.1	87.2	0
4/23/2019	0:04:00	353	60.2	87.1	0
4/23/2019	0:05:00	354	60.1	87.3	0
4/23/2019	0:06:00	355	60.1	87.4	0
4/23/2019	0:07:00	354	60	87.7	0
4/23/2019	0:08:00	353	60	88	0
4/23/2019	0:09:00	355	60	88	0
4/23/2019	0:10:00	352	60.1	88.1	0
4/23/2019	0:11:00	356	60	88.4	0
4/23/2019	0:12:00	354	60.1	88.4	0
4/23/2019	0:13:00	354	60.1	88.5	0
4/23/2019	0:14:00	354	60	89.1	0
4/23/2019	0:15:00	353	60	89.2	0
4/23/2019	0:16:00	355	60.1	88.8	0
4/23/2019	0:17:00	353	60	89	0
4/23/2019	0:18:00	354	60	89.3	0
4/23/2019	0:19:00	353	60	89.2	0
4/23/2019	0:20:00	354	60	89.3	0
4/23/2019	0:21:00	353	60	89.4	0
4/23/2019	0:22:00	354	59.8	90.1	0
4/23/2019	0:23:00	354	59.8	90.4	0
4/23/2019	0:24:00	354	59.8	90.1	0

4/23/2019	0:25:00	354	59.8	90.2	0
4/23/2019	0:26:00	355	59.8	90.3	0
4/23/2019	0:27:00	356	59.8	90.3	0.1
4/23/2019	0:28:00	355	59.9	90.2	0.1
4/23/2019	0:29:00	354	59.9	90.1	0
4/23/2019	0:29:59	356	59.9	90	0
4/23/2019	0:30:59	354	59.8	90.2	0
4/23/2019	0:31:59	356	59.8	90.4	0
4/23/2019	0:32:59	355	59.9	90.1	0
4/23/2019	0:33:59	356	59.9	89.7	0
4/23/2019	0:34:59	358	59.9	89.8	0
4/23/2019	0:35:59	357	59.9	89.8	0
4/23/2019	0:36:59	354	59.8	90	0
4/23/2019	0:37:59	356	59.8	90.2	0
4/23/2019	0:38:59	357	59.8	90.4	0
4/23/2019	0:39:59	356	59.8	90.6	0
4/23/2019	0:40:59	357	59.8	90.3	0
4/23/2019	0:41:59	357	59.8	90.1	0
4/23/2019	0:42:59	358	59.8	89.8	0
4/23/2019	0:43:59	358	59.8	89.9	0
4/23/2019	0:44:59	359	59.9	89.8	0
4/23/2019	0:45:59	359	59.8	90	0
4/23/2019	0:46:59	356	59.7	90.4	0
4/23/2019	0:47:59	356	59.6	90.5	0
4/23/2019	0:48:59	358	59.6	90.4	0
4/23/2019	0:49:59	359	59.6	90.6	0
4/23/2019	0:50:59	359	59.7	90.3	0
4/23/2019	0:51:59	359	59.7	90.1	0
4/23/2019	0:52:59	359	59.6	90.3	0
4/23/2019	0:53:59	357	59.6	90.5	0
4/23/2019	0:54:59	357	59.6	90.5	0
4/23/2019	0:55:59	360	59.6	90.5	0
4/23/2019	0:56:59	357	59.6	90.2	0
4/23/2019	0:57:59	358	59.7	90.2	0



4/23/2019	0:58:59	357	59.7	90.1	0
4/23/2019	0:59:59	357	59.7	90	0
4/23/2019	1:00:59	358	59.7	89.8	0
4/23/2019	1:01:59	359	59.8	89.5	0
4/23/2019	1:02:59	359	59.8	89.4	0
4/23/2019	1:03:59	358	59.8	89	0
4/23/2019	1:04:59	360	59.7	89	0
4/23/2019	1:05:59	359	59.6	89.5	0
4/23/2019	1:06:59	357	59.5	90	0
4/23/2019	1:07:59	358	59.6	90.2	0
4/23/2019	1:08:59	360	59.6	90	0
4/23/2019	1:09:59	359	59.6	89.7	0
4/23/2019	1:10:59	360	59.6	89.7	0
4/23/2019	1:11:59	358	59.5	89.8	0
4/23/2019	1:12:59	361	59.5	89.9	0
4/23/2019	1:13:59	362	59.6	90	0
4/23/2019	1:14:59	361	59.5	90.2	0
4/23/2019	1:15:59	358	59.4	90.1	0
4/23/2019	1:16:59	358	59.4	90	0
4/23/2019	1:17:59	358	59.4	90.1	0
4/23/2019	1:18:59	360	59.5	90.1	0
4/23/2019	1:19:59	359	59.5	89.9	0
4/23/2019	1:20:59	358	59.5	89.4	0
4/23/2019	1:21:59	360	59.5	89.3	0
4/23/2019	1:22:59	359	59.5	89.2	0
4/23/2019	1:23:59	358	59.5	89.3	0
4/23/2019	1:24:59	360	59.5	89.3	0
4/23/2019	1:25:59	360	59.5	89	0
4/23/2019	1:26:59	359	59.5	88.7	0
4/23/2019	1:27:59	360	59.5	88.6	0
4/23/2019	1:28:59	358	59.5	88.7	0
4/23/2019	1:29:59	360	59.5	88.9	0
4/23/2019	1:30:59	358	59.5	89.1	0
4/23/2019	1:31:59	359	59.4	89.5	0

4/23/2019	1:32:59	361	59.4	89.5	0
4/23/2019	1:33:59	361	59.4	89.1	0
4/23/2019	1:34:59	360	59.5	89.1	0
4/23/2019	1:35:59	359	59.5	89.1	0
4/23/2019	1:36:59	362	59.6	89	0
4/23/2019	1:37:59	360	59.5	88.8	0
4/23/2019	1:38:59	361	59.4	88.9	0
4/23/2019	1:39:59	362	59.4	89.2	0
4/23/2019	1:40:59	361	59.2	89.5	0
4/23/2019	1:41:59	361	59.1	89.6	0
4/23/2019	1:42:59	362	59.1	89.3	0
4/23/2019	1:43:59	362	59.1	89.4	0
4/23/2019	1:44:59	362	59.1	89.5	0
4/23/2019	1:45:59	362	59.2	89.4	0
4/23/2019	1:46:59	364	59.2	89.3	0
4/23/2019	1:47:59	363	59.1	89.4	0
4/23/2019	1:48:59	362	59.1	90	0
4/23/2019	1:49:59	361	59	90.2	0
4/23/2019	1:50:59	362	59	90.3	0
4/23/2019	1:51:59	360	59.1	90	0
4/23/2019	1:52:59	360	59.1	89.9	0
4/23/2019	1:53:59	361	59.1	89.9	0
4/23/2019	1:54:59	360	59.1	90.2	0
4/23/2019	1:55:59	362	59	90	0
4/23/2019	1:56:59	363	59	90.1	0
4/23/2019	1:57:59	363	59	89.9	0
4/23/2019	1:58:59	360	59	90	0
4/23/2019	1:59:59	361	59	89.8	0
4/23/2019	2:00:59	361	59	89.7	0
4/23/2019	2:01:59	361	59	90.1	0
4/23/2019	2:02:59	360	59	90	0
4/23/2019	2:03:59	361	59	90.1	0
4/23/2019	2:04:59	362	58.9	90	0
4/23/2019	2:05:59	361	58.9	90.4	0.1

4/23/2019	2:06:59	362	58.9	90.5	0
4/23/2019	2:07:59	364	58.8	90.5	0
4/23/2019	2:08:59	367	58.8	90.8	0
4/23/2019	2:09:59	368	58.8	90.8	0
4/23/2019	2:10:59	367	58.8	90.5	0
4/23/2019	2:11:59	365	58.8	90.2	0
4/23/2019	2:12:59	364	58.9	89.8	0
4/23/2019	2:13:59	363	58.8	90	0
4/23/2019	2:14:59	364	58.9	90.1	0
4/23/2019	2:15:59	365	58.9	90.2	0
4/23/2019	2:16:59	364	58.9	90.2	0
4/23/2019	2:17:59	362	58.9	90.2	0
4/23/2019	2:18:59	364	58.9	90.3	0
4/23/2019	2:19:59	364	58.9	90.6	0
4/23/2019	2:20:59	361	58.8	90.7	0
4/23/2019	2:21:59	365	58.9	91.1	0
4/23/2019	2:22:59	364	58.9	91	0
4/23/2019	2:23:59	364	58.9	90.8	0
4/23/2019	2:24:59	364	58.9	90.5	0
4/23/2019	2:25:59	362	58.8	90.4	0
4/23/2019	2:26:59	362	58.7	90.5	0
4/23/2019	2:27:59	362	58.7	90.8	0
4/23/2019	2:28:59	363	58.7	90.5	0
4/23/2019	2:29:59	363	58.7	90.4	0
4/23/2019	2:30:59	361	58.7	90.7	0
4/23/2019	2:31:59	362	58.7	90.5	0
4/23/2019	2:32:59	360	58.8	90.7	0
4/23/2019	2:33:59	361	58.8	90.6	0
4/23/2019	2:34:59	359	58.7	90.3	0
4/23/2019	2:35:59	361	58.7	90.3	0
4/23/2019	2:36:59	361	58.8	90.5	0
4/23/2019	2:37:59	359	58.8	90.8	0
4/23/2019	2:38:59	360	58.8	90.7	0
4/23/2019	2:39:59	362	58.8	90.6	0.1

4/23/2019	2:40:59	362	58.8	90.9	0
4/23/2019	2:41:59	360	58.8	91.1	0
4/23/2019	2:42:59	358	58.8	91.1	0
4/23/2019	2:43:59	363	58.7	90.8	0
4/23/2019	2:44:59	362	58.7	90.6	0
4/23/2019	2:45:59	364	58.8	90.8	0
4/23/2019	2:46:59	361	58.8	91.1	0
4/23/2019	2:47:59	362	58.8	90.9	0
4/23/2019	2:48:59	362	58.7	90.8	0
4/23/2019	2:49:59	359	58.7	91	0
4/23/2019	2:50:59	362	58.7	90.9	0
4/23/2019	2:51:59	361	58.7	90.8	0
4/23/2019	2:52:59	361	58.7	90.8	0
4/23/2019	2:53:59	363	58.8	91	0
4/23/2019	2:54:59	363	58.7	90.8	0
4/23/2019	2:55:59	360	58.7	90.9	0
4/23/2019	2:56:59	362	58.7	90.9	0
4/23/2019	2:57:59	361	58.6	90.8	0
4/23/2019	2:58:59	363	58.6	90.9	0
4/23/2019	2:59:59	364	58.7	91	0
4/23/2019	3:00:59	365	58.6	90.7	0
4/23/2019	3:01:59	365	58.5	90.5	0
4/23/2019	3:02:59	367	58.5	90.7	0
4/23/2019	3:03:59	364	58.5	90.8	0
4/23/2019	3:04:59	362	58.5	91	0
4/23/2019	3:05:59	362	58.4	90.7	0
4/23/2019	3:06:59	363	58.4	90.8	0
4/23/2019	3:07:59	364	58.4	91.2	0
4/23/2019	3:08:59	364	58.4	91.1	0
4/23/2019	3:09:59	364	58.3	91	0
4/23/2019	3:10:59	366	58.3	90.8	0
4/23/2019	3:11:59	364	58.3	90.8	0
4/23/2019	3:12:59	364	58.3	90.7	0
4/23/2019	3:13:59	365	58.4	91.1	0

4/23/2019	3:14:59	365	58.5	91.8	0
4/23/2019	3:15:59	367	58.4	91.7	0
4/23/2019	3:16:59	365	58.4	91.5	0
4/23/2019	3:17:59	363	58.4	91.9	0
4/23/2019	3:18:59	364	58.4	91.7	0
4/23/2019	3:19:59	365	58.4	91.8	0
4/23/2019	3:20:59	365	58.3	91.6	0
4/23/2019	3:21:59	366	58.2	91.4	0
4/23/2019	3:22:59	368	58.2	91.3	0
4/23/2019	3:23:59	368	58.3	91.4	0
4/23/2019	3:24:59	367	58.3	91.2	0
4/23/2019	3:25:59	366	58.4	91.5	0
4/23/2019	3:26:59	364	58.4	91.6	0
4/23/2019	3:27:59	365	58.3	91.5	0
4/23/2019	3:28:59	366	58.3	91.1	0
4/23/2019	3:29:59	366	58.3	90.9	0
4/23/2019	3:30:59	367	58.3	91	0
4/23/2019	3:31:59	364	58.3	91.3	0
4/23/2019	3:32:59	366	58.3	91.5	0
4/23/2019	3:33:59	364	58.3	91.4	0
4/23/2019	3:34:59	366	58.3	91.6	0
4/23/2019	3:35:59	365	58.4	91.5	0
4/23/2019	3:36:59	370	58.3	91.2	0
4/23/2019	3:37:59	369	58.3	91.1	0
4/23/2019	3:38:59	370	58.3	90.8	0
4/23/2019	3:39:59	369	58.3	90.7	0
4/23/2019	3:40:59	371	58.3	90.9	0
4/23/2019	3:41:59	369	58.2	91	0
4/23/2019	3:42:59	371	58.2	90.8	0
4/23/2019	3:43:59	371	58.2	90.9	0
4/23/2019	3:44:59	373	58.1	90.7	0
4/23/2019	3:45:59	374	58.1	90.5	0
4/23/2019	3:46:59	372	58.1	90.8	0
4/23/2019	3:47:59	369	58	91.8	0

4/23/2019	3:48:59	373	57.9	92	0
4/23/2019	3:49:59	374	57.8	91.5	0
4/23/2019	3:50:59	374	57.8	91.6	0
4/23/2019	3:51:59	377	57.7	91.4	0
4/23/2019	3:52:59	375	57.7	91.1	0
4/23/2019	3:53:59	376	57.7	91	0
4/23/2019	3:54:59	375	57.7	90.9	0
4/23/2019	3:55:59	378	57.7	90.7	0
4/23/2019	3:56:59	377	57.8	90.9	0
4/23/2019	3:57:59	401	57.9	91.2	0
4/23/2019	3:58:59	399	57.9	91.4	0
4/23/2019	3:59:59	383	57.9	91.4	0
4/23/2019	4:00:59	379	57.9	91.6	0
4/23/2019	4:01:59	374	57.9	92	0
4/23/2019	4:02:59	375	57.9	92.2	0
4/23/2019	4:03:59	376	57.9	91.9	0
4/23/2019	4:04:59	375	57.8	91.1	0
4/23/2019	4:05:59	376	57.7	91.1	0
4/23/2019	4:06:59	378	57.7	91.3	0
4/23/2019	4:07:59	376	57.7	91.6	0
4/23/2019	4:08:59	377	57.7	92	0
4/23/2019	4:09:59	377	57.7	92	0
4/23/2019	4:10:59	375	57.6	92.3	0
4/23/2019	4:11:59	373	57.6	92.5	0
4/23/2019	4:12:59	376	57.6	92.7	0.1
4/23/2019	4:13:59	376	57.6	92.8	0
4/23/2019	4:14:59	376	57.6	92.7	0
4/23/2019	4:15:59	374	57.5	92.2	0
4/23/2019	4:16:59	378	57.5	91.7	0
4/23/2019	4:17:59	376	57.3	92.3	0
4/23/2019	4:18:59	377	57.3	92.4	0
4/23/2019	4:19:59	377	57.3	92.5	0
4/23/2019	4:20:59	378	57.4	93.5	0
4/23/2019	4:21:59	379	57.4	93.2	0

4/23/2019	4:22:59	376	57.4	93	0
4/23/2019	4:23:59	377	57.5	93	0
4/23/2019	4:24:59	379	57.4	92.7	0
4/23/2019	4:25:59	380	57.4	92.8	0
4/23/2019	4:26:59	381	57.4	92.5	0
4/23/2019	4:27:59	383	57.4	92.1	0
4/23/2019	4:28:59	382	57.4	92	0
4/23/2019	4:29:59	380	57.4	92.1	0
4/23/2019	4:30:59	379	57.4	92.5	0
4/23/2019	4:31:59	378	57.4	93.1	0
4/23/2019	4:32:59	378	57.5	93.1	0
4/23/2019	4:33:59	378	57.4	92.8	0
4/23/2019	4:34:59	379	57.4	93	0
4/23/2019	4:35:59	378	57.4	92.9	0
4/23/2019	4:36:59	379	57.4	92.9	0
4/23/2019	4:37:59	381	57.5	92.8	0
4/23/2019	4:38:59	381	57.5	92.6	0
4/23/2019	4:39:59	387	57.5	92.4	0
4/23/2019	4:40:59	382	57.6	92.8	0
4/23/2019	4:41:59	379	57.6	92.8	0
4/23/2019	4:42:59	379	57.6	92.6	0
4/23/2019	4:43:59	379	57.5	92.6	0
4/23/2019	4:44:59	378	57.5	92.9	0
4/23/2019	4:45:59	378	57.5	93.2	0
4/23/2019	4:46:59	379	57.5	93.5	0
4/23/2019	4:47:59	379	57.4	93.5	0
4/23/2019	4:48:59	379	57.4	93.5	0
4/23/2019	4:49:59	381	57.4	93.6	0
4/23/2019	4:50:59	381	57.2	93.5	0
4/23/2019	4:51:59	386	57.2	93.4	0
4/23/2019	4:52:59	384	57.2	93.3	0
4/23/2019	4:53:59	387	57.2	93.3	0
4/23/2019	4:54:59	385	57.1	93	0
4/23/2019	4:55:59	386	57.1	93.2	0



4/23/2019	4:56:59	385	57.1	93.4	0
4/23/2019	4:57:59	384	57.2	93.5	0
4/23/2019	4:58:59	386	57.2	93.5	0
4/23/2019	4:59:59	384	57.1	93.2	0
4/23/2019	5:00:59	386	57.2	93.1	0
4/23/2019	5:01:59	386	57.3	92.9	0
4/23/2019	5:02:59	383	57.2	92.8	0
4/23/2019	5:03:59	382	57.2	92.9	0
4/23/2019	5:04:59	382	57.2	92.8	0
4/23/2019	5:05:59	381	57.2	92.8	0
4/23/2019	5:06:59	388	57.3	93.1	0
4/23/2019	5:07:59	396	57.3	93.3	0
4/23/2019	5:08:59	384	57.2	93.5	0
4/23/2019	5:09:59	383	57.2	93.5	0
4/23/2019	5:10:59	383	57.2	93.3	0
4/23/2019	5:11:59	384	57.2	93.4	0
4/23/2019	5:12:59	381	57.1	93.2	0
4/23/2019	5:13:59	384	57	93.3	0
4/23/2019	5:14:59	382	57	93.8	0
4/23/2019	5:15:59	384	57	94	0
4/23/2019	5:16:59	384	57	93.7	0
4/23/2019	5:17:59	383	57	93.5	0
4/23/2019	5:18:59	384	57	93.5	0
4/23/2019	5:19:59	384	56.9	93.6	0
4/23/2019	5:20:59	384	57	93.7	0
4/23/2019	5:21:59	386	56.9	93.8	0
4/23/2019	5:22:59	383	56.9	94	0
4/23/2019	5:23:59	384	56.9	93.9	0
4/23/2019	5:24:59	380	56.9	93.7	0
4/23/2019	5:25:59	382	56.8	94	0
4/23/2019	5:26:58	385	56.9	94.2	0
4/23/2019	5:27:58	384	56.9	94.5	0
4/23/2019	5:28:58	386	56.9	94.1	0
4/23/2019	5:29:58	387	56.9	94	0

4/23/2019	5:30:58	386	56.9	93.9	0
4/23/2019	5:31:58	385	56.9	94.1	0
4/23/2019	5:32:58	386	56.9	94.1	0
4/23/2019	5:33:58	388	56.9	94	0
4/23/2019	5:34:58	388	56.9	94.3	0
4/23/2019	5:35:58	389	57	94.3	0
4/23/2019	5:36:58	388	57	94.2	0
4/23/2019	5:37:58	387	57.1	94.4	0
4/23/2019	5:38:58	397	57.1	94.2	0
4/23/2019	5:39:58	398	57.1	93.9	0
4/23/2019	5:40:58	393	57	93.6	0
4/23/2019	5:41:58	390	57	94.7	0
4/23/2019	5:42:58	389	57	94.4	0
4/23/2019	5:43:58	388	56.9	94.3	0
4/23/2019	5:44:58	390	56.9	94.2	0
4/23/2019	5:45:58	390	57	94.4	0
4/23/2019	5:46:58	388	57	94.5	0
4/23/2019	5:47:58	390	57	94.4	0
4/23/2019	5:48:58	391	57	94.3	0
4/23/2019	5:49:58	391	57	94.1	0
4/23/2019	5:50:58	393	57	94.1	0
4/23/2019	5:51:58	391	57	94.2	0
4/23/2019	5:52:58	392	56.9	94	0
4/23/2019	5:53:58	392	56.9	93.8	0
4/23/2019	5:54:58	397	56.9	94.1	0
4/23/2019	5:55:58	396	57	94.2	0
4/23/2019	5:56:58	393	57.1	94.5	0
4/23/2019	5:57:58	397	57.1	94.1	0
4/23/2019	5:58:58	393	57.1	94	0
4/23/2019	5:59:58	392	57.2	94.2	0
4/23/2019	6:00:58	394	57.2	94.1	0
4/23/2019	6:01:58	394	57.3	94.3	0
4/23/2019	6:02:58	394	57.4	94.3	0
4/23/2019	6:03:58	398	57.5	94.2	0

4/23/2019	6:04:58	401	57.6	93.4	0
4/23/2019	6:05:58	397	57.6	92.7	0
4/23/2019	6:06:58	395	57.5	92.5	0
4/23/2019	6:07:58	394	57.5	92.4	0.1
4/23/2019	6:08:58	395	57.5	92.2	0.1
4/23/2019	6:09:58	394	57.5	92.3	0
4/23/2019	6:10:58	397	57.5	93	0
4/23/2019	6:11:58	396	57.5	93.1	0
4/23/2019	6:12:58	394	57.4	93	0
4/23/2019	6:13:58	395	57.3	93.1	0
4/23/2019	6:14:58	396	57.3	92.9	0
4/23/2019	6:15:58	399	57.3	92.5	0
4/23/2019	6:16:58	398	57.4	92.3	0
4/23/2019	6:17:58	399	57.3	92.4	0
4/23/2019	6:18:58	399	57.3	92.7	0
4/23/2019	6:19:58	396	57.4	93.3	0
4/23/2019	6:20:58	396	57.5	93.6	0
4/23/2019	6:21:58	393	57.6	93	0
4/23/2019	6:22:58	392	57.6	93.3	0
4/23/2019	6:23:58	389	57.6	93.2	0
4/23/2019	6:24:58	388	57.5	93.1	0.1
4/23/2019	6:25:58	386	57.5	93.7	0
4/23/2019	6:26:58	390	57.5	94	0
4/23/2019	6:27:58	387	57.5	94.2	0
4/23/2019	6:28:58	392	57.5	94	0
4/23/2019	6:29:58	400	57.3	94.5	0
4/23/2019	6:30:58	402	57.3	94.3	0.1
4/23/2019	6:31:58	403	57.4	93.7	0.1
4/23/2019	6:32:58	407	57.4	93.1	0
4/23/2019	6:33:58	404	57.4	92.7	0
4/23/2019	6:34:58	409	57.5	92.4	0
4/23/2019	6:35:58	409	57.6	92.2	0.1
4/23/2019	6:36:58	409	57.5	92.2	0.1
4/23/2019	6:37:58	404	57.6	92.3	0.1

4/23/2019	6:38:58	405	57.6	92.3	0.1
4/23/2019	6:39:58	408	57.5	92.6	0.1
4/23/2019	6:40:58	410	57.6	92.6	0.1
4/23/2019	6:41:58	408	57.7	92.5	0.2
4/23/2019	6:42:58	409	57.9	92.6	0.4
4/23/2019	6:43:58	410	58	92.5	0.2
4/23/2019	6:44:58	407	58	92.3	0.3
4/23/2019	6:45:58	407	58.1	92	0.2
4/23/2019	6:46:58	405	58.2	91.7	0.3
4/23/2019	6:47:58	402	58.3	91.7	0.2
4/23/2019	6:48:58	405	58.4	91.8	0.4
4/23/2019	6:49:58	399	58.6	92.2	0.2
4/23/2019	6:50:58	393	58.7	92.3	0.1
4/23/2019	6:51:58	392	58.8	91.7	0.1
4/23/2019	6:52:58	391	58.9	91.8	0.2
4/23/2019	6:53:58	391	58.9	91.6	0.1
4/23/2019	6:54:58	389	59	91.6	0.1
4/23/2019	6:55:58	387	59	91.6	0.1
4/23/2019	6:56:58	380	59.1	92.3	0
4/23/2019	6:57:58	382	59.2	92.3	0.1
4/23/2019	6:58:58	384	59.2	92.1	0.1
4/23/2019	6:59:58	388	59.2	93	0
4/23/2019	7:00:58	379	59.2	92.5	0
4/23/2019	7:01:58	379	59.3	92.6	0
4/23/2019	7:02:58	377	59.4	92.1	0
4/23/2019	7:03:58	377	59.4	91.8	0
4/23/2019	7:04:58	376	59.3	91.9	0
4/23/2019	7:05:58	376	59.3	92.1	0.1
4/23/2019	7:06:58	377	59.2	92.1	0.3
4/23/2019	7:07:58	378	59.2	92	0.3
4/23/2019	7:08:58	372	59.2	92	0
4/23/2019	7:09:58	374	59.4	92	0
4/23/2019	7:10:58	374	59.4	91.8	0
4/23/2019	7:11:58	378	59.5	91.8	0.1

4/23/2019	7:12:58	384	59.4	92	0
4/23/2019	7:13:58	390	59.6	91.8	0
4/23/2019	7:14:58	384	59.8	91.1	0
4/23/2019	7:15:58	378	60.2	89.9	0
4/23/2019	7:16:58	382	60.5	88.6	0
4/23/2019	7:17:58	388	61.2	87.5	0
4/23/2019	7:18:58	383	63.4	84.4	0
4/23/2019	7:19:58	393	65.8	79.2	0
4/23/2019	7:20:58	404	66.7	73.1	0.2
4/23/2019	7:21:58	401	66.6	71.3	0.4
4/23/2019	7:22:58	407	67.2	70.6	0.3
4/23/2019	7:23:58	409	69	68.2	0.3
4/23/2019	7:24:58	410	70.3	64.7	0.4
4/23/2019	7:25:58	404	71.3	62	0.6
4/23/2019	7:26:58	407	72.1	59.9	0.5
4/23/2019	7:27:58	412	73	58	0.6
4/23/2019	7:28:58	412	72.4	57.3	0.5
4/23/2019	7:29:58	402	70.7	58.7	0.6
4/23/2019	7:30:58	400	70.9	59.4	0.6
4/23/2019	7:31:58	407	71.4	58.9	0.5
4/23/2019	7:32:58	413	73.1	56.1	0.4
4/23/2019	7:33:58	412	74.3	53.5	0.5
4/23/2019	7:34:58	410	74.4	51.5	0.4
4/23/2019	7:35:58	398	72.2	53.6	0.6
4/23/2019	7:36:58	401	72.5	55.3	0.6
4/23/2019	7:37:58	408	73.2	53.2	0.3
4/23/2019	7:38:58	396	70.2	56.1	0.6
4/23/2019	7:39:58	394	70.3	58	0.4
4/23/2019	7:40:58	402	70.6	58	0.3
4/23/2019	7:41:58	395	70.3	58.9	0.3
4/23/2019	7:42:58	399	72.7	56.4	0.2
4/23/2019	7:43:58	406	74.2	53.8	0.3
4/23/2019	7:44:58	401	75.3	51.3	0.3
4/23/2019	7:45:58	413	76.6	49.1	0.5

4/23/2019	7:46:58	411	76.8	46.9	0.5
4/23/2019	7:47:58	409	77.9	45.8	0.5
4/23/2019	7:48:58	412	77.7	44.2	0.7
4/23/2019	7:49:58	412	79.9	42.7	0.6
4/23/2019	7:50:58	428	79.6	42.5	0.6
4/23/2019	7:51:58	413	79.9	42.2	0.6
4/23/2019	7:52:58	409	79.1	42	0.6
4/23/2019	7:53:58	401	79	43	0.6
4/23/2019	7:54:58	405	78	43.8	0.5
4/23/2019	7:55:58	403	78.7	43.5	0.5
4/23/2019	7:56:58	404	80.5	42	0.5
4/23/2019	7:57:58	407	81	40.9	0.6
4/23/2019	7:58:58	406	80.3	41	0.6
4/23/2019	7:59:58	404	80.1	40.6	0.5
4/23/2019	8:00:58	413	80.5	39.4	0.6
4/23/2019	8:01:58	399	76.9	43.4	0.7
4/23/2019	8:02:58	395	73.2	48.6	0.7
4/23/2019	8:03:58	395	72.4	52.6	0.4
4/23/2019	8:04:58	401	71.6	54.3	0.1
4/23/2019	8:05:58	399	69.6	57.2	0.1
4/23/2019	8:06:58	397	68.4	61.4	0.1
4/23/2019	8:07:58	396	67.8	63.3	0
4/23/2019	8:08:58	414	67.2	65.6	0
4/23/2019	8:09:58	401	65.7	67.6	0
4/23/2019	8:10:58	399	65	70.9	0
4/23/2019	8:11:58	396	65	71.7	0
4/23/2019	8:12:58	392	64.8	73.2	0
4/23/2019	8:13:58	390	64.4	73.9	0.1
4/23/2019	8:14:58	386	63.7	76.1	0
4/23/2019	8:15:58	388	64	76.3	0
4/23/2019	8:16:58	397	64.2	76.7	0
4/23/2019	8:17:58	389	64.4	76.5	0
4/23/2019	8:18:58	399	64.9	76.2	0
4/23/2019	8:19:58	388	64.4	76.3	0

4/23/2019	8:20:58	384	64.9	75.9	0
4/23/2019	8:21:58	385	65.1	75.1	0
4/23/2019	8:22:58	385	64.5	75.9	0
4/23/2019	8:23:58	389	64.5	75.9	0
4/23/2019	8:24:58	388	64.5	76.5	0
4/23/2019	8:25:58	388	64.9	75.8	0
4/23/2019	8:26:58	388	65	75.6	0
4/23/2019	8:27:58	388	64.6	76.4	0
4/23/2019	8:28:58	387	64.5	76.7	0
4/23/2019	8:29:58	387	64.4	76.9	0
4/23/2019	8:30:58	391	64.6	77	0
4/23/2019	8:31:58	388	64.2	76.8	0
4/23/2019	8:32:58	382	64	77.6	0
4/23/2019	8:33:58	383	64.1	78.1	0
4/23/2019	8:34:58	383	64.6	78.1	0
4/23/2019	8:35:58	383	63.9	78.1	0
4/23/2019	8:36:58	381	64.4	78.6	0
4/23/2019	8:37:58	383	65	77	0
4/23/2019	8:38:58	383	64.2	77.2	0
4/23/2019	8:39:58	384	64.9	77.1	0
4/23/2019	8:40:58	384	64.9	76.9	0
4/23/2019	8:41:58	383	65.3	76	0
4/23/2019	8:42:58	379	65.3	75.9	0
4/23/2019	8:43:58	384	65.6	75.2	0
4/23/2019	8:44:58	381	65.1	75	0.1
4/23/2019	8:45:58	378	65.1	75.7	0
4/23/2019	8:46:58	379	65.5	75.3	0
4/23/2019	8:47:58	379	65.9	75.1	0.1
4/23/2019	8:48:58	385	65.4	74.7	0.1
4/23/2019	8:49:58	381	65.2	75.4	0.1
4/23/2019	8:50:58	383	65.8	74.7	0.4
4/23/2019	8:51:58	380	65.7	73.8	0.3
4/23/2019	8:52:58	379	64.4	74.6	0.1
4/23/2019	8:53:58	380	64.1	76.8	0



4/23/2019	8:54:58	385	64.7	76.7	0.1
4/23/2019	8:55:58	380	64.3	76.6	0.1
4/23/2019	8:56:58	379	64.5	76.6	0.1
4/23/2019	8:57:58	379	64.4	76.5	0
4/23/2019	8:58:58	381	64.7	76.2	0
4/23/2019	8:59:58	383	64.7	76.2	0
4/23/2019	9:00:58	380	65	75.5	0
4/23/2019	9:01:58	380	64.6	75.9	0
4/23/2019	9:02:58	376	65.5	75.3	0
4/23/2019	9:03:58	378	65.5	73.8	0
4/23/2019	9:04:58	379	65.4	73.8	0
4/23/2019	9:05:58	373	64.8	74.2	0
4/23/2019	9:06:58	375	65.1	73.7	0
4/23/2019	9:07:58	376	65.2	73.4	0
4/23/2019	9:08:58	379	65.1	74.3	0
4/23/2019	9:09:58	376	66.2	74	0
4/23/2019	9:10:58	377	69.5	73.5	0
4/23/2019	9:11:58	378	72.7	68.8	0
4/23/2019	9:12:58	394	75.8	63.5	0
4/23/2019	9:13:58	392	74.6	59.1	0.2
4/23/2019	9:14:58	406	76.9	56.8	0.1
4/23/2019	9:15:58	404	78.9	53.5	0.2
4/23/2019	9:16:58	393	79.6	52.8	0.5
4/23/2019	9:17:58	402	77.9	52.3	0.5
4/23/2019	9:18:58	397	76.4	54.7	0.5
4/23/2019	9:19:58	389	75.9	54.6	0.5
4/23/2019	9:20:58	395	76.4	51.8	0.2
4/23/2019	9:21:58	392	76.2	49.9	0.2
4/23/2019	9:22:58	371	75.3	50.7	0.3
4/23/2019	9:23:58	386	74	53.6	0.3
4/23/2019	9:24:58	382	71.6	56.2	0.3
4/23/2019	9:25:58	384	73.7	57.6	0.1
4/23/2019	9:26:58	393	77.4	55.7	0
4/23/2019	9:27:58	387	74.6	54.5	0.3

4/23/2019	9:28:58	387	74.6	55.5	0.4
4/23/2019	9:29:58	391	76.8	55.5	0.1
4/23/2019	9:30:58	395	78.1	52.5	0
4/23/2019	9:31:58	397	78.1	50.4	0.1
4/23/2019	9:32:58	405	80.2	47.8	0.3
4/23/2019	9:33:58	400	80.5	45.7	0.3
4/23/2019	9:34:58	399	81.6	44.8	0.4
4/23/2019	9:35:58	399	83.2	43.3	0.2
4/23/2019	9:36:58	398	81.4	43.5	0.5
4/23/2019	9:37:58	397	79.8	43.7	0.5
4/23/2019	9:38:58	398	79.6	46.2	0.5
4/23/2019	9:39:58	397	80.2	45.8	0.3
4/23/2019	9:40:58	396	79.9	44.7	0.2
4/23/2019	9:41:58	397	80.1	45.3	0.5
4/23/2019	9:42:58	421	83.3	42.3	0.1
4/23/2019	9:43:58	414	84	41.2	0.1
4/23/2019	9:44:58	403	84.5	39.7	0.2
4/23/2019	9:45:58	399	84	41	0.4
4/23/2019	9:46:58	397	81.3	42.4	0.7
4/23/2019	9:47:58	400	80	44.4	0.5
4/23/2019	9:48:58	384	79.5	43.4	0.2
4/23/2019	9:49:58	387	78.9	46.2	0.4
4/23/2019	9:50:58	387	80.8	45.3	0.1
4/23/2019	9:51:58	388	81.2	42.9	0
4/23/2019	9:52:58	386	79.7	44.3	0.7
4/23/2019	9:53:58	389	80.3	44.9	0.3
4/23/2019	9:54:58	385	80.4	43.4	0.1
4/23/2019	9:55:58	386	79.1	43.8	0.2
4/23/2019	9:56:58	383	77.3	46.6	0.5
4/23/2019	9:57:58	383	78.6	46.1	0.1
4/23/2019	9:58:58	384	77.4	46	0.1
4/23/2019	9:59:58	387	77.3	47.8	0.2
4/23/2019	10:00:58	387	79.9	46.3	0.1
4/23/2019	10:01:58	388	80.2	45.8	0

4/23/2019	10:02:58	390	80.4	44.1	0.2
4/23/2019	10:03:58	386	81.9	41.4	0
4/23/2019	10:04:58	389	83.3	41.2	0.1
4/23/2019	10:05:58	394	83.4	40.6	0.3
4/23/2019	10:06:58	393	83.1	40.6	0.4
4/23/2019	10:07:58	389	81.8	41.9	0.5
4/23/2019	10:08:58	386	82.4	41.7	0.2
4/23/2019	10:09:58	391	83.6	39.3	0
4/23/2019	10:10:58	388	83	40.4	0.4
4/23/2019	10:11:58	392	83.9	39.1	0.3
4/23/2019	10:12:58	391	84	39.1	0.3
4/23/2019	10:13:58	391	82.8	37.6	0.3
4/23/2019	10:14:58	390	80.5	38.6	0.6
4/23/2019	10:15:58	386	78	41.1	0.5
4/23/2019	10:16:58	384	77.2	41.2	0.1
4/23/2019	10:17:58	383	76.4	42.2	0
4/23/2019	10:18:58	383	77.3	44	0.1
4/23/2019	10:19:58	382	77.1	45.4	0
4/23/2019	10:20:57	381	76.2	46.2	0
4/23/2019	10:21:57	382	75	48.4	0
4/23/2019	10:22:57	393	73.5	51.9	0.1
4/23/2019	10:23:57	374	73.7	52.4	0
4/23/2019	10:24:57	391	73.5	53.4	0
4/23/2019	10:25:57	392	74.1	53.8	0
4/23/2019	10:26:57	386	74.1	54	0
4/23/2019	10:27:57	387	74.2	53.4	0
4/23/2019	10:28:57	385	74.4	53.5	0
4/23/2019	10:29:57	390	71.8	55.3	0.2
4/23/2019	10:30:57	384	71.5	57.5	0.1
4/23/2019	10:31:57	384	70.9	58.3	0
4/23/2019	10:32:57	385	70.4	58.9	0
4/23/2019	10:33:57	387	71	59.6	0
4/23/2019	10:34:57	385	72	58	0
4/23/2019	10:35:57	384	71.3	58.2	0

4/23/2019	10:36:57	384	72.1	58.1	0
4/23/2019	10:37:57	383	72.1	57.4	0
4/23/2019	10:38:57	381	72.7	57.9	0
4/23/2019	10:39:57	385	73.7	56.6	0
4/23/2019	10:40:57	384	73.7	55.1	0
4/23/2019	10:41:57	385	74.7	54.8	0.1
4/23/2019	10:42:57	385	74.8	54.1	0.1
4/23/2019	10:43:57	407	74.7	54.6	0.1
4/23/2019	10:44:57	392	75	54.1	0.1
4/23/2019	10:45:57	384	74.5	53.6	0
4/23/2019	10:46:57	384	73.8	54.5	0.1
4/23/2019	10:47:57	385	75	54.7	0
4/23/2019	10:48:57	386	74.8	53.7	0
4/23/2019	10:49:57	383	74	53.2	0.1
4/23/2019	10:50:57	385	74.4	54.2	0.1
4/23/2019	10:51:57	386	74.7	53.8	0.1
4/23/2019	10:52:57	386	74.9	53.7	0.1
4/23/2019	10:53:57	388	75.4	53.1	0.1
4/23/2019	10:54:57	383	74.2	53.5	0.2
4/23/2019	10:55:57	382	74.8	53.6	0.1
4/23/2019	10:56:57	386	75.1	53.3	0.1
4/23/2019	10:57:57	378	73.5	54	0.1
4/23/2019	10:58:57	379	74.1	54.5	0.1
4/23/2019	10:59:57	385	74.3	54.5	0.1
4/23/2019	11:00:57	385	75	54.1	0.1
4/23/2019	11:01:57	383	75.1	53.7	0.1
4/23/2019	11:02:57	382	74.2	54.2	0.1
4/23/2019	11:03:57	378	74	54.5	0
4/23/2019	11:04:57	379	74.1	55.1	0.1
4/23/2019	11:05:57	380	73.9	54.9	0.1
4/23/2019	11:06:57	377	73.6	55.5	0.1
4/23/2019	11:07:57	374	73.1	55.3	0
4/23/2019	11:08:57	378	73.8	55.8	0.1
4/23/2019	11:09:57	379	73.8	56	0.1

4/23/2019	11:10:57	377	73.9	55.4	0.1
4/23/2019	11:11:57	373	72.5	56.8	0
4/23/2019	11:12:57	373	72.5	57.4	0.1
4/23/2019	11:13:57	375	72.8	57.9	0.1
4/23/2019	11:14:57	377	73.7	56.8	0
4/23/2019	11:15:57	377	73.7	56.2	0.1
4/23/2019	11:16:57	380	73.8	55.7	0
4/23/2019	11:17:57	382	73.7	55.7	0
4/23/2019	11:18:57	382	74	55.9	0.1
4/23/2019	11:19:57	382	74	55.7	0.1
4/23/2019	11:20:57	378	74.1	54.7	0.1
4/23/2019	11:21:57	378	74.6	54.6	0.1
4/23/2019	11:22:57	377	73.9	54.5	0.2
4/23/2019	11:23:57	379	74	54.7	0.1
4/23/2019	11:24:57	384	74.4	54.5	0.1
4/23/2019	11:25:57	387	74.4	55	0.2
4/23/2019	11:26:57	383	74.9	54.4	0.4
4/23/2019	11:27:57	382	74.1	54.7	0.1
4/23/2019	11:28:57	378	74.1	55.1	0.1
4/23/2019	11:29:57	379	74.4	55	0.1
4/23/2019	11:30:57	378	74.1	54.9	0.1
4/23/2019	11:31:57	377	74.1	54.8	0
4/23/2019	11:32:57	376	74.1	55.4	0.1
4/23/2019	11:33:57	378	73.9	55.6	0.1
4/23/2019	11:34:57	378	74.6	55.4	0
4/23/2019	11:35:57	378	74.9	54.5	0
4/23/2019	11:36:57	382	75.2	54	0.1
4/23/2019	11:37:57	386	75.8	53.7	0.1
4/23/2019	11:38:57	387	75.9	53.2	0.1
4/23/2019	11:39:57	384	75.1	53.4	0.1
4/23/2019	11:40:57	379	74.8	54.3	0.2
4/23/2019	11:41:57	380	74.9	53.9	0.1
4/23/2019	11:42:57	380	74.9	54.3	0.1
4/23/2019	11:43:57	384	75.4	53.7	0.2

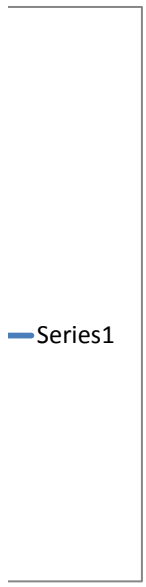
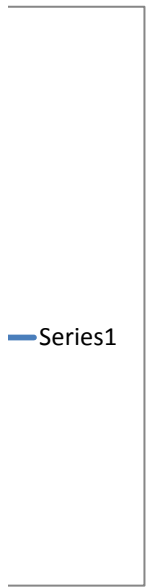
4/23/2019	11:44:57	380	75.3	54	0.1
4/23/2019	11:45:57	380	74.8	53.6	0.1
4/23/2019	11:46:57	376	73.5	55.3	0.2
4/23/2019	11:47:57	374	73.4	55.6	0.1
4/23/2019	11:48:57	379	74.1	55.2	0.1
4/23/2019	11:49:57	382	74.9	54.4	0.1
4/23/2019	11:50:57	380	74.5	54.4	0
4/23/2019	11:51:57	380	74.5	55	0.1
4/23/2019	11:52:57	380	74.3	55.4	0.2
4/23/2019	11:53:57	382	75.2	54.7	0.2
4/23/2019	11:54:57	384	75.6	53.6	0.1
4/23/2019	11:55:57	387	74.8	54	0.3
4/23/2019	11:56:57	385	75.2	54	0.1
4/23/2019	11:57:57	388	74.8	54.5	0.1
4/23/2019	11:58:57	384	75.3	53.9	0.1
4/23/2019	11:59:57	437	74.7	54.9	0.1
4/23/2019	12:00:57	442	75	54.2	0.1
4/23/2019	12:01:57	408	75.2	54	0.1
4/23/2019	12:02:57	401	74.8	54.2	0.1
4/23/2019	12:03:57	388	74	54.8	0.1
4/23/2019	12:04:57	384	74	54.7	0.1
4/23/2019	12:05:57	381	73.8	55.2	0.2
4/23/2019	12:06:57	376	74	55.6	0
4/23/2019	12:07:57	383	75.1	55.3	0.1
4/23/2019	12:08:57	388	75.3	53.9	0.1
4/23/2019	12:09:57	383	74.8	53.1	0.1
4/23/2019	12:10:57	383	75.7	53.2	0.1
4/23/2019	12:11:57	380	76.2	52.7	0.1
4/23/2019	12:12:57	382	75.3	52.7	0.1
4/23/2019	12:13:57	387	75.3	53.2	0.3
4/23/2019	12:14:57	390	75.9	53.4	0.3
4/23/2019	12:15:57	391	76.3	52.8	0.2
4/23/2019	12:16:57	393	76.2	52.5	0.1
4/23/2019	12:17:57	390	74.9	52.5	0.2

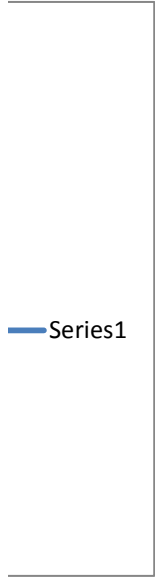
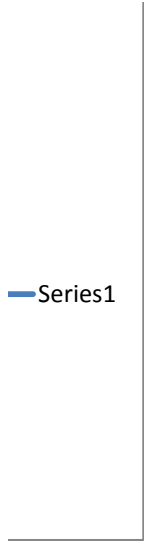
4/23/2019	12:18:57	387	74.1	53.5	0.2
4/23/2019	12:19:57	388	73.5	55.4	0.2
4/23/2019	12:20:57	388	73.8	55.7	0.2
4/23/2019	12:21:57	387	73.9	55.9	0.1
4/23/2019	12:22:57	388	74	55.9	0.1
4/23/2019	12:23:57	384	74.1	55.5	0
4/23/2019	12:24:57	386	75.4	54.8	0
4/23/2019	12:25:57	386	75.5	53.5	0.1
4/23/2019	12:26:57	385	74.5	54.4	0.2
4/23/2019	12:27:57	383	74.5	54.6	0.1
4/23/2019	12:28:57	386	74.1	54.7	0.2
4/23/2019	12:29:57	389	74.5	54.3	0.1
4/23/2019	12:30:57	391	74.5	54.8	0.1
4/23/2019	12:31:57	391	74.8	54	0.1
4/23/2019	12:32:57	391	75.4	53.7	0.1
4/23/2019	12:33:57	395	74.9	54.2	0.2
4/23/2019	12:34:57	393	74.2	54.5	0.2
4/23/2019	12:35:57	388	73.8	54.9	0.3
4/23/2019	12:36:57	390	74.4	55	0.1
4/23/2019	12:37:57	389	74.3	54.5	0.2
4/23/2019	12:38:57	389	74.3	54.6	0.2
4/23/2019	12:39:57	387	74.1	55.4	0.2
4/23/2019	12:40:57	389	74.1	55.7	0.2
4/23/2019	12:41:57	388	74.2	55.4	0.1
4/23/2019	12:42:57	388	75	54.7	0.1
4/23/2019	12:43:57	386	75.5	54.4	0.1
4/23/2019	12:44:57	384	74.4	54.5	0.2
4/23/2019	12:45:57	387	73.9	55.8	0.2
4/23/2019	12:46:57	408	74	55.3	0.1
4/23/2019	12:47:57	383	74.6	55.3	0.1
4/23/2019	12:48:57	386	75.7	54.2	0.1
4/23/2019	12:49:57	387	75.4	53.5	0.1
4/23/2019	12:50:57	387	74.8	53.9	0.2
4/23/2019	12:51:57	387	74.8	55.4	0.2



4/23/2019	12:52:57	387	75.6	54.4	0.2
4/23/2019	12:53:57	382	75.1	53.5	0.1
4/23/2019	12:54:57	381	74.6	54.8	0.3
4/23/2019	12:55:57	379	75.5	54.2	0.1
4/23/2019	12:56:57	380	75.3	53.7	0.1
4/23/2019	12:57:57	382	75.4	53.9	0.2
4/23/2019	12:58:57	381	75.9	53.3	0.1
4/23/2019	12:59:57	381	76	52.9	0.2
4/23/2019	13:00:57	386	76.4	52.5	0.2
4/23/2019	13:01:57	382	77.1	51.7	0.1
4/23/2019	13:02:57	383	76.7	52	0.2
4/23/2019	13:03:57	386	76.3	52.7	0.2
4/23/2019	13:04:57	387	75.7	53.3	0.2
4/23/2019	13:05:57	383	75.2	54.1	0.2
4/23/2019	13:06:57	387	75.6	53.5	0.1
4/23/2019	13:07:57	383	75.4	53.5	0.1
4/23/2019	13:08:57	392	76.7	52.6	0.2
4/23/2019	13:09:57	389	76.5	52.2	0.2
4/23/2019	13:10:57	383	75.1	53.2	0.3
4/23/2019	13:11:57	385	75.3	54	0.1
4/23/2019	13:12:57	390	76.1	53.9	0.1
4/23/2019	13:13:57	386	75.9	53.2	0.1
4/23/2019	13:14:57	386	75.6	53.5	0.3
4/23/2019	13:15:57	384	77	52.8	0.1
4/23/2019	13:16:57	387	77.3	52	0.1
4/23/2019	13:17:57	386	76.4	52.5	0.3
4/23/2019	13:18:57	385	77	52	0.1
4/23/2019	13:19:57	385	76.4	52.1	0.2
4/23/2019	13:20:57	382	75.9	52.8	0.3
4/23/2019	13:21:57	384	75.6	53.1	0.2
4/23/2019	13:22:57	382	75.6	54.4	0.2
4/23/2019	13:23:57	386	74.8	54.9	0.2
4/23/2019	13:24:57	406	75.3	55	0.2
4/23/2019	13:25:57	403	75.7	54.7	0.1

4/23/2019	13:26:57	386	76.3	53.9	0.2
4/23/2019	13:27:57	381	75.5	53.7	0.1
4/23/2019	13:28:57	382	75.5	54.5	0.2
4/23/2019	13:29:57	381	76	54.1	0.2
4/23/2019	13:30:57	389	76.2	54	0.1
4/23/2019	13:31:57	386	76.4	53.5	0.2
4/23/2019	13:32:57	387	76.6	53.2	0.3
4/23/2019	13:33:57	389	75.9	53.2	0.3
4/23/2019	13:34:57	387	76.3	53.3	0.2
4/23/2019	13:35:57	382	76.9	52.9	0.1
4/23/2019	13:36:57	380	76.7	53.3	0.2
4/23/2019	13:37:57	384	77.6	52.3	0.1
4/23/2019	13:38:57	386	77.6	51.5	0.2
4/23/2019	13:39:57	390	77.8	51.4	0.2
4/23/2019	13:40:57	391	78	51.3	0.2





## **APPENDIX III - Data Downloads.**

Work Order No.: SE-066738

Date of Service: 4/18/2019

Unit Under Test: TSI 7575 Q-TRAK

Asset No.: FA00091

Technician: Steve Rozunick

Initials: SR

Serial No: 7575X1141003

TEST	Specification	Result
Standard Calibration	Pass/Fail	PASS

**TEST STANDARDS USED:**

DESCRIPTION	LOT NO./EXPIRATION DATE	QUANTITY
Zero Air	Lot No. TKBH-1-5 Exp. 10/06/21	1
100ppm Carbon Monoxide in Air	Lot No. TFBI-50-100-3, EXP 05/08/2022	1
1000ppm Carbon Dioxide in N2	Lot No. TFBI-34-1000-3 EXP. 05/08/2022	1

**TEST EQUIPMENT USED:**

DESCRIPTION	ASSET NO.	SERIAL NO.	DATE OF LAST CAL	DATE CAL DUE
EdgeTech Dewmaster	PPE-0046	44196	3/11/2019	3/11/2020

Test Equipment and standards are traceable to National standards.

Work Order No.: SE-066741

Date of Service: 4/19/2019

Unit Under Test: TSI 7545 IAQ-CALC

Asset No.: FA00101

Technician: Steve Rozunick

Initials: SR

Serial No: T75451139001

TEST	Specification	Result
Standard Calibration	Pass/Fail	PASS

**TEST STANDARDS USED:**

DESCRIPTION	LOT NO./EXPIRATION DATE	QUANTITY
Zero Air	Lot No. TKBH-1-5 Exp. 10/06/21	1
100ppm Carbon Monoxide in Air	Lot No. TFBI-50-100-3, EXP 05/08/2022	1
1000ppm Carbon Dioxide in N2	Lot No. TFBI-34-1000-3 EXP. 05/08/2022	1

**TEST EQUIPMENT USED:**

DESCRIPTION	ASSET NO.	SERIAL NO.	DATE OF LAST CAL	DATE CAL DUE
EdgeTech Dewmaster	PPE-0046	44196	3/11/2019	3/11/2020

Test Equipment and standards are traceable to National standards.





# Calibration Certificate

rev 8/9/11

Work Order No.: SE-066740

Date of Service: 4/19/2019

Unit Under Test: TSI 7575 Q-TRAK

Asset No.: FA00221

Technician: Steve Rozunick

Initials: SR

Serial No: 7565X1013005

TEST	Specification	Result
Standard Calibration	Pass/Fail	PASS

## TEST STANDARDS USED:

DESCRIPTION	LOT NO./EXPIRATION DATE	QUANTITY
Zero Air	Lot No. TKBH-1-5 Exp. 10/06/21	1
100ppm Carbon Monoxide in Air	Lot No. TFBI-50-100-3, EXP 05/08/2022	1
1000ppm Carbon Dioxide in N2	Lot No. TFBI-34-1000-3 EXP. 05/08/2022	1

## TEST EQUIPMENT USED:

DESCRIPTION	ASSET NO.	SERIAL NO.	DATE OF LAST CAL	DATE CAL DUE
EdgeTech Dewmaster	PPE-0046	44196	3/11/2019	3/11/2020

Test Equipment and standards are traceable to National standards.

Work Order No.: SE-066303  
Date of Service: 4/8/2019 12:00:00 AM

Unit Under Test: TSI 7575 Q-TRAK

Asset No.: FA01497

Emily Mantel

Technician Initials: EM

Serial No: 7575X1425003

TEST	Specification	Result
Standard Calibration	Pass/Fail	PASS

**TEST STANDARDS USED:**

DESCRIPTION	LOT NO./EXPIRATION DATE	QUANTITY
1000ppm Carbon Dioxide in N2	Lot No. KBG-34-1000-11 Exp. 10/24/20	1
100ppm Carbon Monoxide in Air	Lot No. KBG-50-100-11 Exp. 10/24/2020	1
Zero Air	Lot No. MBG-1-13 Exp. 02/23/2021	1
EdgeTech DewMaster PPE-0155	S/N 51182 Cal Due 5/7/2019	1

**TEST EQUIPMENT USED:**

DESCRIPTION	ASSET NO.	SERIAL NO.	DATE OF LAST CAL	DATE CAL DUE

Test Equipment and standards are traceable to National standards.

**Expires: 07/08/19**



# Calibration Certificate

rev 8/9/11

Work Order No.: SE-066739

Date of Service: 4/18/2019

Unit Under Test: TSI 7575 Q-TRAK

Asset No.: FA01501

Technician: Steve Rozunick

Initials: SR

Serial No: 7575X1425002

TEST	Specification	Result
Standard Calibration	Pass/Fail	PASS

## TEST STANDARDS USED:

DESCRIPTION	LOT NO./EXPIRATION DATE	QUANTITY
Zero Air	Lot No. TKBH-1-5 Exp. 10/06/21	1
100ppm Carbon Monoxide in Air	Lot No. TFBI-50-100-3, EXP 05/08/2022	1
1000ppm Carbon Dioxide in N2	Lot No. TFBI-34-1000-3 EXP. 05/08/2022	1

## TEST EQUIPMENT USED:

DESCRIPTION	ASSET NO.	SERIAL NO.	DATE OF LAST CAL	DATE CAL DUE
EdgeTech Dewmaster	PPE-0046	44196	3/11/2019	3/11/2020

Test Equipment and standards are traceable to National standards.

FA03253



# CERTIFICATE OF CALIBRATION

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
 Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

ENVIRONMENT CONDITION		
TEMPERATURE	75.5 (24.2)	°F (°C)
RELATIVE HUMIDITY	47	%RH
BAROMETRIC PRESSURE	28.93 (979.7)	inHg (hPa)

MODEL	9306-V2
SERIAL NUMBER	93061725007
CUSTOMER INST ID	

☒ AS LEFT  
☐ AS FOUND

☒ IN TOLERANCE  
☐ OUT OF TOLERANCE

## AEROTrak CALIBRATION KIT

MEASUREMENT VARIABLE	SYSTEM ID	DATE LAST CALIBRATED	CALIBRATION DUE DATE
7201-02F	E004434	03-07-2018	09-30-2018
FLOW METER	E005518	01-04-2018	07-31-2018
FLOW METER	E005633	01-22-2018	07-31-2018

## PARTICLE STANDARDS

PARTICLE SIZE	STANDARD UNCERTAINTY	STANDARD DEVIATION	LOT NO.	EXPIRATION DATE
0.303 µm	0.003 µm	0.0047 µm	174664	10/31/2019
0.508 µm	0.004 µm	0.0085 µm	185892	6/30/2020
0.994 µm	0.0075 µm	0.010 µm	187477	8/31/2020
2.92 µm	0.015 µm	0.03 µm	181443	2/28/2020
5.020 µm	0.015 µm	0.06 µm	179268	1/31/2020
9.850 µm	0.04 µm	0.13 µm	186004	6/30/2020

TSI does hereby certify that the calibration performed on the above described instrument meets the requirements of ISO 21501-4. TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to the United States National Institute of Standards and Technology (NIST) or has been verified with respect to instrumentation whose accuracy is traceable to NIST, or is derived from accepted values of physical constants. TSI is registered to ISO-9001:2015.

*As Found*

CALIBRATED

June 28, 2018

DATE



FA03253



# CERTIFICATE OF CALIBRATION

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA  
 Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

## SIZE CALIBRATION AND VERIFICATION OF SIZE SETTING

NOMINAL PARTICLE SIZE	GAIN STAGE	DIGITAL CUTPOINT	EXPANDED UNCERTAINTY
0.3 $\mu\text{m}$	A	36	4.1%
0.5 $\mu\text{m}$	A	358	3.9%
1 $\mu\text{m}$	B	6	3.9%
3 $\mu\text{m}$	B	53	3.7%
5 $\mu\text{m}$	B	151	3.6%
10 $\mu\text{m}$	B	530	3.7%

## COUNTING EFFICIENCY

PARTICLE SIZE	ACTUAL	ALLOWABLE RANGE	PASS/FAIL
0.3 $\mu\text{m}$	50%	50% $\pm$ 20%	Pass
0.5 $\mu\text{m}$	92%	100% $\pm$ 10%	Pass

## SIZE RESOLUTION

PARTICLE SIZE	MEASURED	ALLOWABLE RANGE	PASS/FAIL
0.5 $\mu\text{m}$	6.5%	$\leq$ 15%	Pass

## FALSE COUNT RATE

SAMPLE TIME (MIN)	SAMPLED (L)	MEASURED COUNTS (#)	CONCENTRATION (#/M <sup>3</sup> )	95% UCL (#/M <sup>3</sup> )	ALLOWABLE RANGE (#/M <sup>3</sup> )	PASS/FAIL
30	85	1	11.82	55.6	$\leq$ 70.9	Pass

## SAMPLING FLOW RATE (L/MIN)

NOMINAL	ACTUAL	ERROR	ALLOWABLE RANGE	PASS/FAIL
2.83	2.82	-0.4 %	$\pm$ 5%	Pass

## SAMPLING TIME †

MEASURED	ALLOWABLE RANGE	PASS/FAIL
$\leq \pm 0.1\%$	$\pm 1\%$	Pass

## RESPONSE RATE †

MEASURED	ALLOWABLE RANGE	PASS/FAIL
0.08%	$\leq 0.5\%$	Pass

## MAXIMUM PARTICLE CONCENTRATION †

210000000 #/m<sup>3</sup> @10% Coincidence Loss

† Tested and verified during product development

## CALIBRATION INTERVAL

CALIBRATION DATE	EXPIRATION DATE
June 28, 2018	June 28, 2019



# INSTRUMENT CALIBRATION REPORT

**Pine Environmental Services LLC**

1340 Reynolds Avenue, Suite 108  
Irvine, CA 92614  
Toll-free: 888-620-7463

## **Pine Environmental Services, Inc.**

**Instrument ID** 38180  
**Description** Q-TRAK Indoor Air Quality Monitor 7575 ( Display)  
**Calibrated** 4/19/2019 2:35:17PM

<b>Manufacturer</b> Tsi	<b>State Certified</b>
<b>Model Number</b> 7575X	<b>Status</b> Pass
<b>Serial Number/ Lot Number</b> 7575X1716011	<b>Temp °C</b> 24
<b>Location</b> California	<b>Humidity %</b> 55
<b>Department</b>	

### Calibration Specifications

**Group #** 1  
**Group Name** Functional Test  
**Test Performed: Yes** **As Found Result: Pass** **As Left Result: Pass**

### Test Instruments Used During the Calibration

				<u>(As Of Cal Entry Date)</u>	
<u>Test Standard ID</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number / Lot Number</u>	<u>Next Cal Date / Last Cal Date / Expiration Date / Opened Date</u>

### Notes about this calibration

**Calibration Result** Calibration Successful  
**Who Calibrated** Eduardo Turcios

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment**  
**Please call 800-301-9663 for Technical Assistance**

# INSTRUMENT CALIBRATION REPORT



Advanced Labs, Inc.

## Pine Environmental Services, Inc

**Instrument ID** 38180  
**Description** TSI 7575 -X Q-Trak  
**Calibrated** 5/10/2018

**Manufacturer** TSI  
**Model Number** 7575-X  
**Serial Number** 7575X1716011  
**Location** New Jersey  
**Temp** 77

**Classification**  
**Status** pass  
**Frequency** Yearly EOM  
**Department** Lab  
**Humidity** 34

### Calibration Specifications

**Group #** 1  
**Group Name** Barometric Pressure  
**Stated Accy** Pct of Reading

**Range Acc %** 0.0000  
**Reading Acc %** 3.0000  
**Plus/Minus** 0.000

<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	<u>Out Type</u>	<u>Fnd As</u>	<u>Lft As</u>	<u>Dev%</u>	<u>Pass/Fail</u>
30.000 / 29.760	inHg	29.760	inHg	29.800	29.760	0.00%	Pass

### Test Instruments Used During the Calibration

<u>Test Instrument ID</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Serial Number</u>	<u>(As Of Cal Entry Date)</u>	
				<u>Last Cal Date</u>	<u>Next Cal Date</u>
OMEGA HX93AC/DP25-E	Omega HX93AC/DP25-E	Omega Engineering	1010368 035025 035026	9/15/2016	9/15/2018
OMEGA PX02K1-16A5T /DP25-E-A	Omega PX02K1-16A5T/DP25-E-A	Omega Engineering	168377/8375030	9/15/2016	9/15/2018
OMEGA WT4401-D	Omega WT4401-D	Omega Engineering	101105	9/15/2016	9/15/2018

### Notes about this calibration

**Calibration Result** Calibration Successful  
**Who Calibrated** Kevin Cole

**Advanced Labs, Inc. hereby certifies that this instrument is calibrated and functions to meet the manufacture's specifications using NIST traceable standards, or is derived from accepted values of physical constants.**



# INSTRUMENT CALIBRATION REPORT



## Pine Environmental Services, Inc

Instrument ID R12855  
Description TSI 982 Probe  
Calibrated 11/27/2018

Manufacturer TSI  
Model Number 982  
Serial Number P11270013  
Location New Jersey  
Temp 71

Classification  
Status pass  
Frequency Yearly EOM  
Department Lab  
Humidity 27

### Calibration Specifications

Group # 1  
Group Name Carbon Dioxide  
Stated Accy Pct of Reading

Range Acc % 0.0000  
Reading Acc % 3.0000  
Plus/Minus 0.00

<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	<u>Out Type</u>	<u>End As</u>	<u>Lft As</u>	<u>Dev%</u>	<u>Pass/Fail</u>
0.00 / 0.00	ppm	0.00	ppm	30.00	0.00	0.00%	Pass
1000.00 / 1000.00	ppm	1000.00	ppm	1,010.00	1,010.00	1.00%	Pass

Group # 2  
Group Name Carbon Monoxide  
Stated Accy Pct of Reading

Range Acc % 0.0000  
Reading Acc % 3.0000  
Plus/Minus 0.00

<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	<u>Out Type</u>	<u>End As</u>	<u>Lft As</u>	<u>Dev%</u>	<u>Pass/Fail</u>
0.00 / 0.00	ppm	0.00	ppm	0.00	0.00	0.00%	Pass
100.00 / 100.00	ppm	100.00	ppm	108.70	101.50	1.50%	Pass

Group # 3  
Group Name Relative Humidity  
Stated Accy Pct of Reading

Range Acc % 0.0000  
Reading Acc % 3.0000  
Plus/Minus 0.00

<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	<u>Out Type</u>	<u>End As</u>	<u>Lft As</u>	<u>Dev%</u>	<u>Pass/Fail</u>
30.00 / 30.30	%	30.30	%	30.80	30.10	-0.66%	Pass

Group # 4  
Group Name Temperature  
Stated Accy Plus / Minus

Range Acc % 0.0000  
Reading Acc % 0.0000  
Plus/Minus 1.00

<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	<u>Out Type</u>	<u>End As</u>	<u>Lft As</u>	<u>Dev%</u>	<u>Pass/Fail</u>
70.00 / 70.80	°F	70.80	°F	72.20	70.80	0.00%	Pass

### Test Instruments Used During the Calibration

<u>Test Instrument ID</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Serial Number</u>	<u>(As Of Cal Entry Date)</u>	
				<u>Last Cal Date</u>	<u>Next Cal Date</u>
CO/CO2_34LS-375	100 ppm CO, 1000 ppm CO2	Calgaz	MAO-375-1		6/9/2019
MICHELL DM-509-TX-01	Relative Humidity Meter	Michell	273296	9/17/2018	9/17/2019
NITROGEN	Nitrogen 99.999%	Liquid Technology	7727-37-9	6/1/2016	6/1/2019
ZERO_AIR_105 L-1	Zero Grade Air THC <1.0 PPM	Liquid Technology	KAP-A-10	10/1/2015	10/20/2019

## INSTRUMENT CALIBRATION REPORT



### Pine Environmental Services, Inc

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**Instrument ID** R12855  
**Description** TSI 982 Probe  
**Calibrated** 11/27/2018

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#### Notes about this calibration

**Calibration Result** Calibration Successful  
**Who Calibrated** David Galego

**Advanced Labs, Inc. hereby certifies that this instrument is calibrated and functions to meet the manufacture's specifications using NIST traceable standards, or is derived from accepted values of physical constants.**



# INSTRUMENT CALIBRATION REPORT

**Pine Environmental Services LLC**

1340 Reynolds Avenue, Suite 108

Irvine, CA 92614

Toll-free: 888-620-7463

**Pine Environmental Services, Inc.**

**Instrument ID** R12855  
**Description** TSI 982 Probe  
**Calibrated** 4/19/2019 2:38:50PM

**Manufacturer** Tsi  
**Model Number** 982  
**Serial Number/ Lot Number** P11270013  
**Location** California  
**Department**

**State Certified**  
**Status** Pass  
**Temp °C** 24  
**Humidity %** 55

## Calibration Specifications

**Group #** 1  
**Group Name** Carbon Dioxide  
**Stated Accy** Pct of Reading

**Range Acc %** 0.0000  
**Reading Acc %** 3.0000  
**Plus/Minus** 0.00

<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	<u>Out Type</u>	<u>Fnd As</u>	<u>Lft As</u>	<u>Dev%</u>	<u>Pass/Fail</u>
1000.00 / 1000.00	PPM	1000.00	PPM	1,000.00	1,000.00	0.00%	Pass

**Group #** 2  
**Group Name** Carbon Monoxide  
**Stated Accy** Pct of Reading

**Range Acc %** 0.0000  
**Reading Acc %** 3.0000  
**Plus/Minus** 0.00

<u>Nom In Val / In Val</u>	<u>In Type</u>	<u>Out Val</u>	<u>Out Type</u>	<u>Fnd As</u>	<u>Lft As</u>	<u>Dev%</u>	<u>Pass/Fail</u>
50.00 / 50.00	PPM	50.00	PPM	50.00	50.00	0.00%	Pass

## Test Instruments Used During the Calibration

**(As Of Cal Entry Date)**

<u>Test Standard ID</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Serial Number / Lot Number</u>	<u>Last Cal Date / Opened Date</u>	<u>Next Cal Date / Expiration Date</u>
CA CO 50 PPM (LOT# EAP-50-50-6)	CA CO 50 PPM (LOT#TJBH-375-1)	Porta Gas	GP10708	EAP-50-50-6		4/15/2020
CA CO2 1000 PPM (LOT# 0215FB14)	CA CO2 1000 PPM (LOT# 0215FB14)	Calgaz	GP10610	0215FB14		2/15/2020
CA ZERO AIR (LOT# CAG-1-6)	CA ZERO AIR (LOT# CAG-1-6)	Gasco	31845	CAQ-1-6		3/3/2020

## Notes about this calibration

**Calibration Result** Calibration Successful

**Who Calibrated** Eduardo Turcios

Pine Environmental Services LLC Windsor Industrial Park, 92 North Main Street, Bldg 20, Windsor, NJ 08561, 800-301-9663  
www.pine-environmental.com

# INSTRUMENT CALIBRATION REPORT



**Pine Environmental Services LLC**

1340 Reynolds Avenue, Suite 108

Irvine, CA 92614

Toll-free: 888-620-7463

## **Pine Environmental Services, Inc.**

---

**Instrument ID** R12855

**Description** TSI 982 Probe

**Calibrated** 4/19/2019 2:38:50PM

---

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

**Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment  
Please call 800-301-9663 for Technical Assistance**

## **APPENDIX IV - Photographs.**

# Photo Album

April 22, 2019



DSCN3650 Delaminated paint and cracks in stairs.





DSCN3651 Delaminated paint and cracks in stairs.



DSCN3652 Outside windows.





DSCN3653 Window frames are dry rotted and falling apart. Possible reason for blistering paint and cracks in stairs





DSCN3654 Area where inspection has not be performed. Safe access should be made.



DSCN3655 Area where inspection has not be performed. Safe access should be made.





DSCN3656 Area where inspection has not be performed. Safe access should be made.



DSCN3658





DSCN3659 Areas around 2<sup>nd</sup> Floor Bedroom #3 window paint is delaminating and cracks observed. Area is falling apart.



DSCN3660



DSCN3662 Dark stains are observed around parapet and is believed to be mold.





DSCN3663

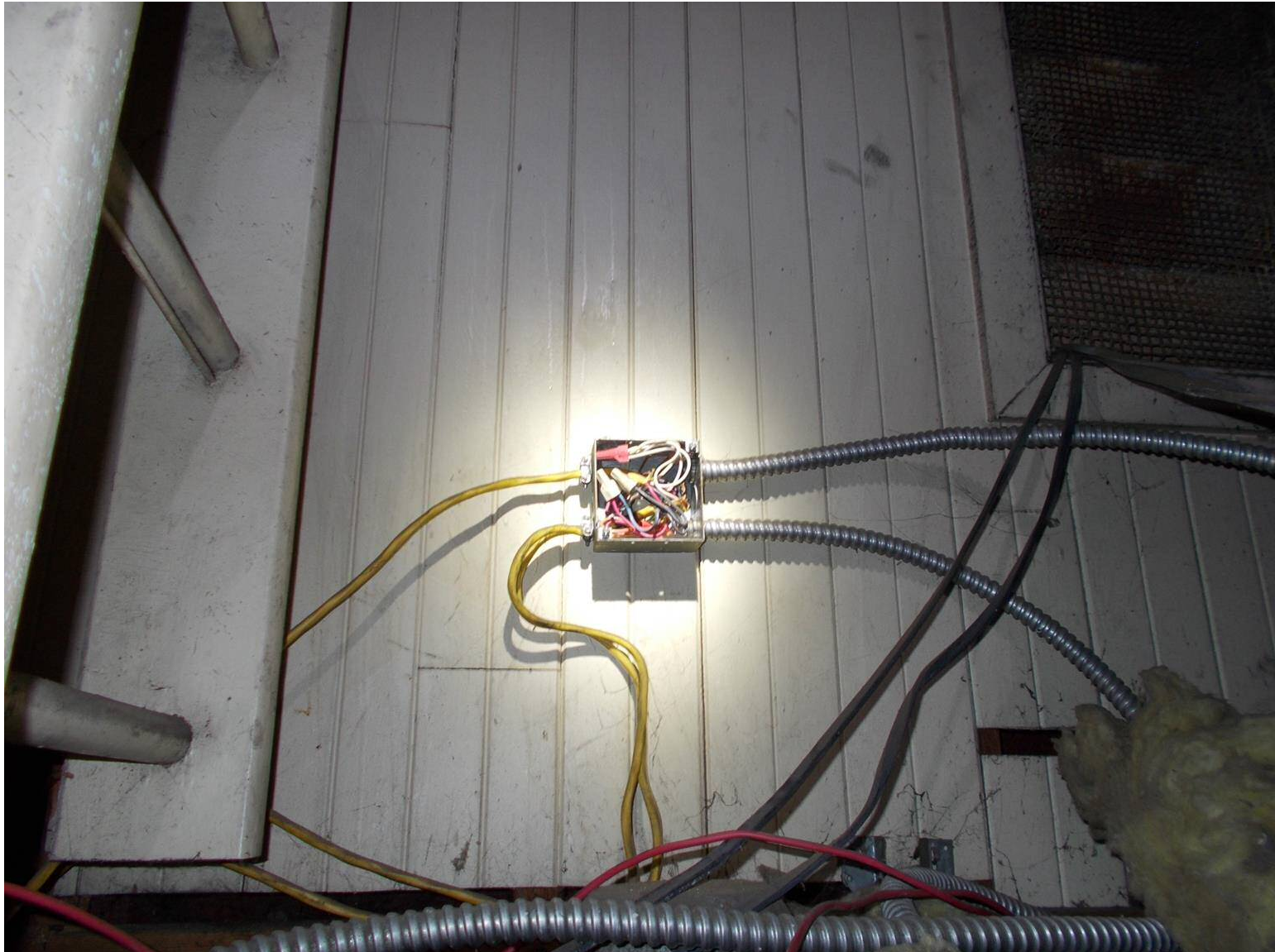


DSCN3664 Access to hose tower (old).



DSCN3665 Bedroom is not sealed from outside. Vents are open.





DSCN3666 There are electrical problems (open J-box) with exposed wires.





DSCN3667

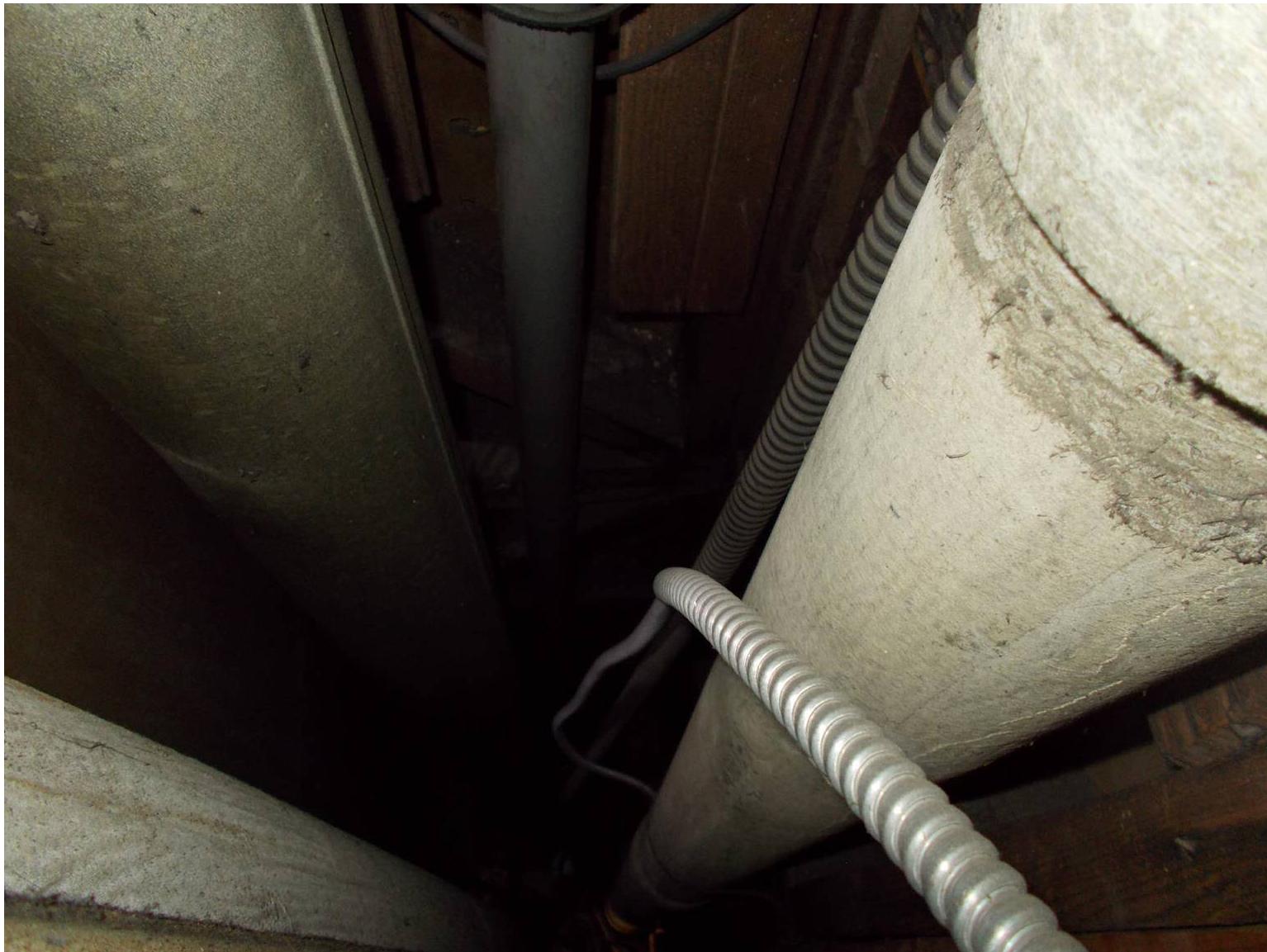


DSCN3668 There are piles of dust.





DSCN3669 There are gaps which lead into the garage where gases can migrate in and eventually settle in the bedroom.



DSCN3670 Transite pipe from a heater. Open void/gap.





DSCN3671



DSCN3672





DSCN3673 Open louvers which allows gases and dust to migrate and settle in the hose tower.





DSCN3674 Dust and gases migrate from light canister, access hatch, and vent(s) in bedroom at the ceiling.



DSCN3675 Wall HVAC unit gaps where you can see the outside.



DSCN3676 Can light where dust and gases can migrate into the bedroom from the hose tower.



DSCN3677 Window leaks water.





DSCN3678



DSCN3679 Paint is blistered and cracks are observed. Water stains on sill are observed.



DSCN3680





DSCN3681



DSCN3682



DSCN3683



DSCN3684 Captain's room bathroom ceiling has brown spots which were observed.



DSCN3685





DSCN3686 There is a video of the crawlspace showing areas where mold is observed.



DSCN3687 It is questionable whether this is a proper door between the garage and the living spaces of the station.





DSCN3688 Another door where it is questionable whether this is a proper door between the garage and the living spaces of the station.



DSCN3689





DSCN3690 Gap from the old hose tower (prior photographs) and the garage.



DSCN3691 The distance between the exhaust (truck exhaust system) and the open louvers in the hose tower is close.





DSCN3692



DSCN3693 Framing around window is deteriorated.



DSCN3694 Washer is used for oily rags from the trucks and uniforms. Washer also leaks water on floor.





DSCN3695





DSCN3696



DSCN3697 Wall mounted HVAC unit 1<sup>st</sup> floor has gaps.





DSCN3698 Crawlspace accesses where water is entering the building. Area gets flooded when it rains.





DSCN3699Crawlspace access.





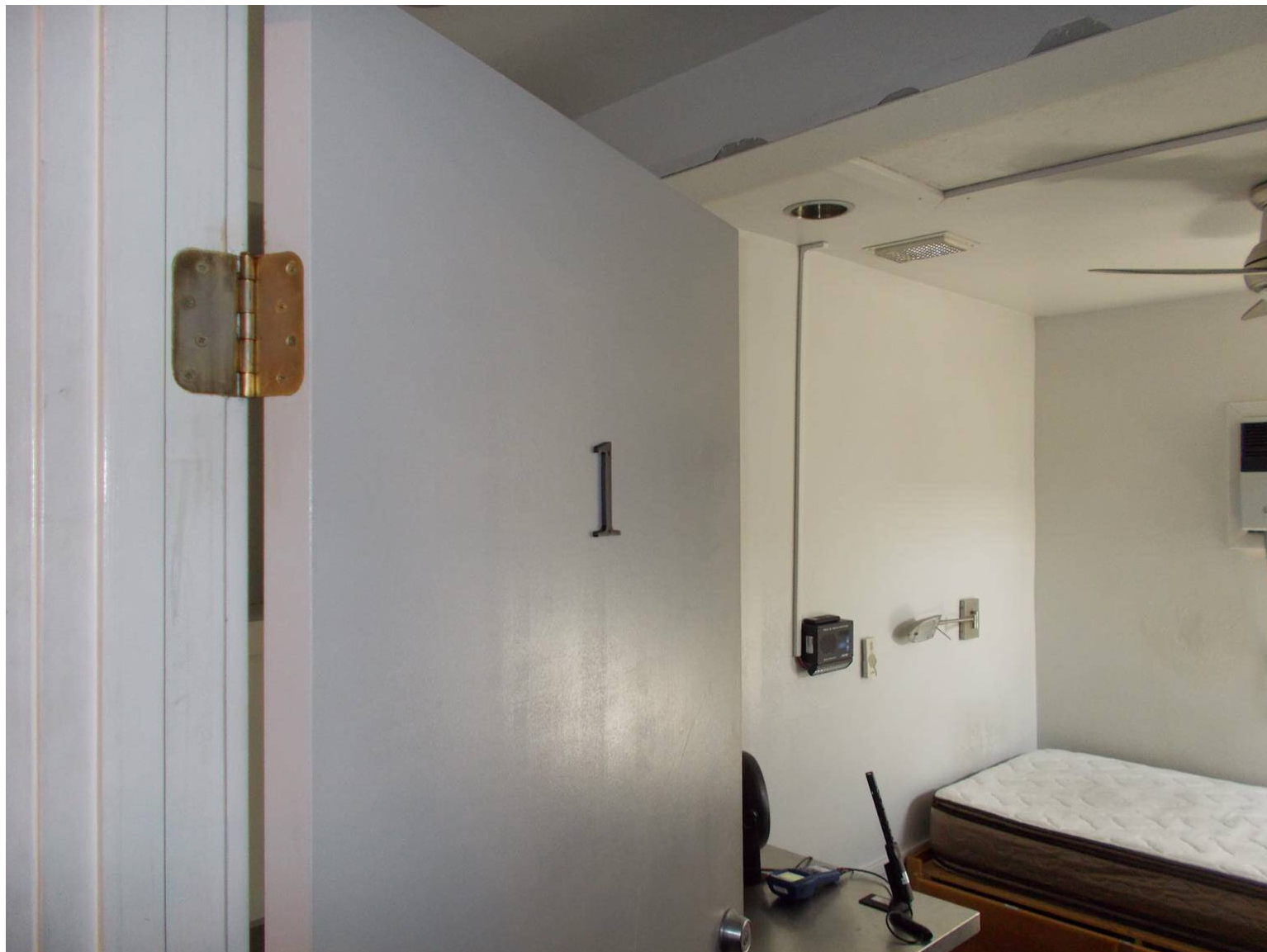
DSCN3700 Tree growing out of the building and around piping.



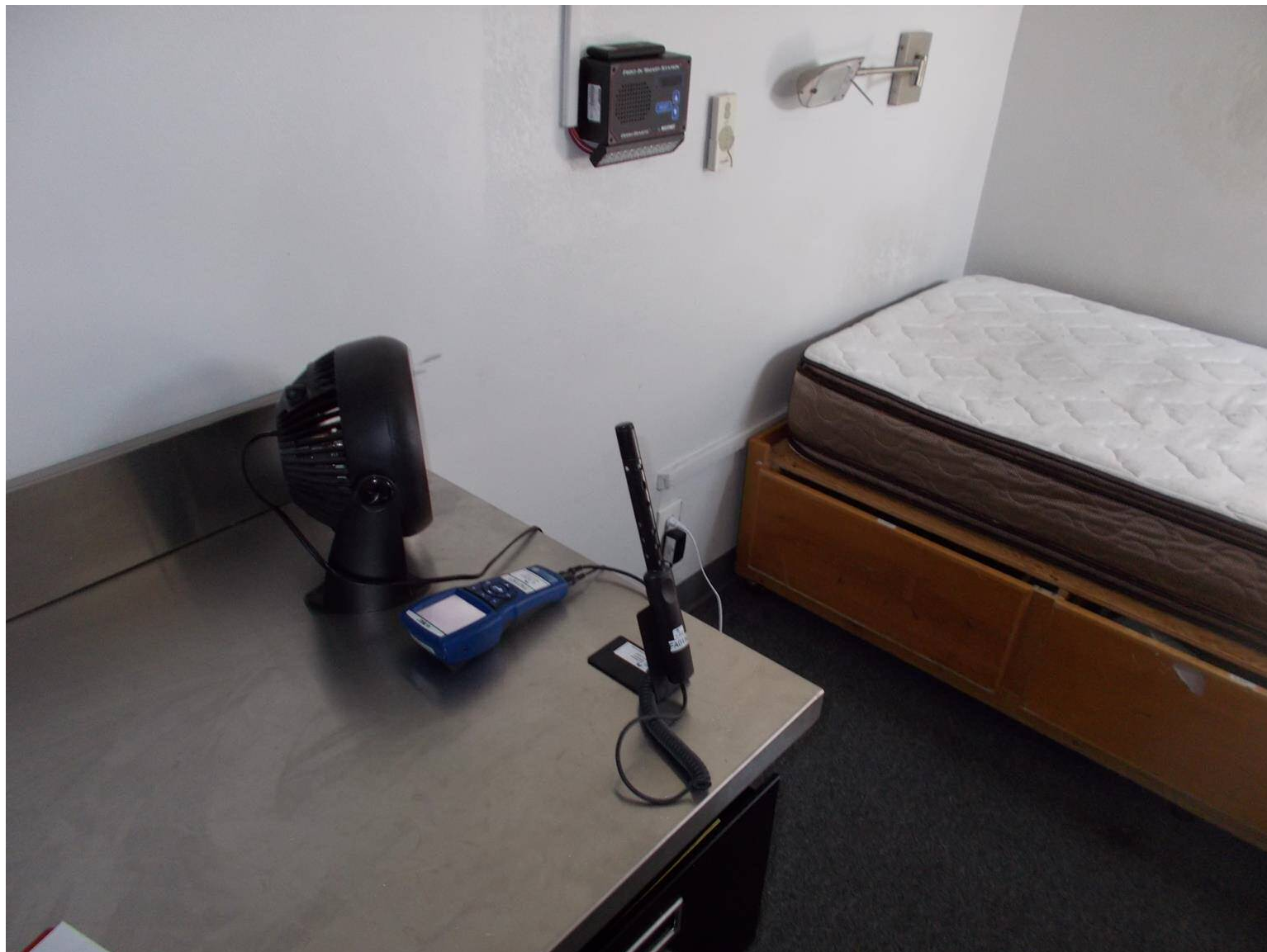


DSCN3701





DSCN3702 QTRAK (FA01501) Room #1 2<sup>nd</sup> Floor



DSCN3703QTRAK (FA01501) Room #1 2<sup>nd</sup> Floor

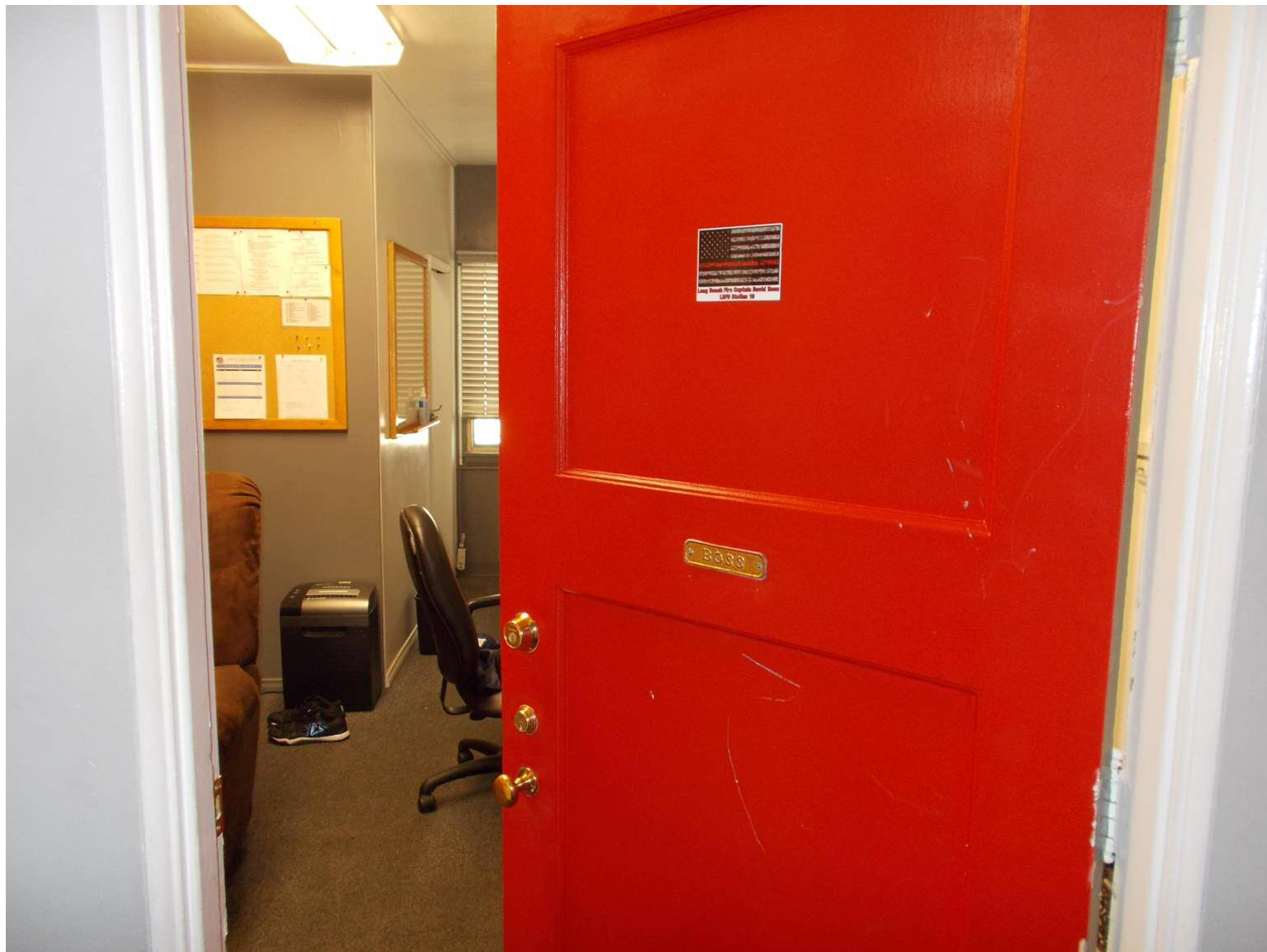


DSCN3704

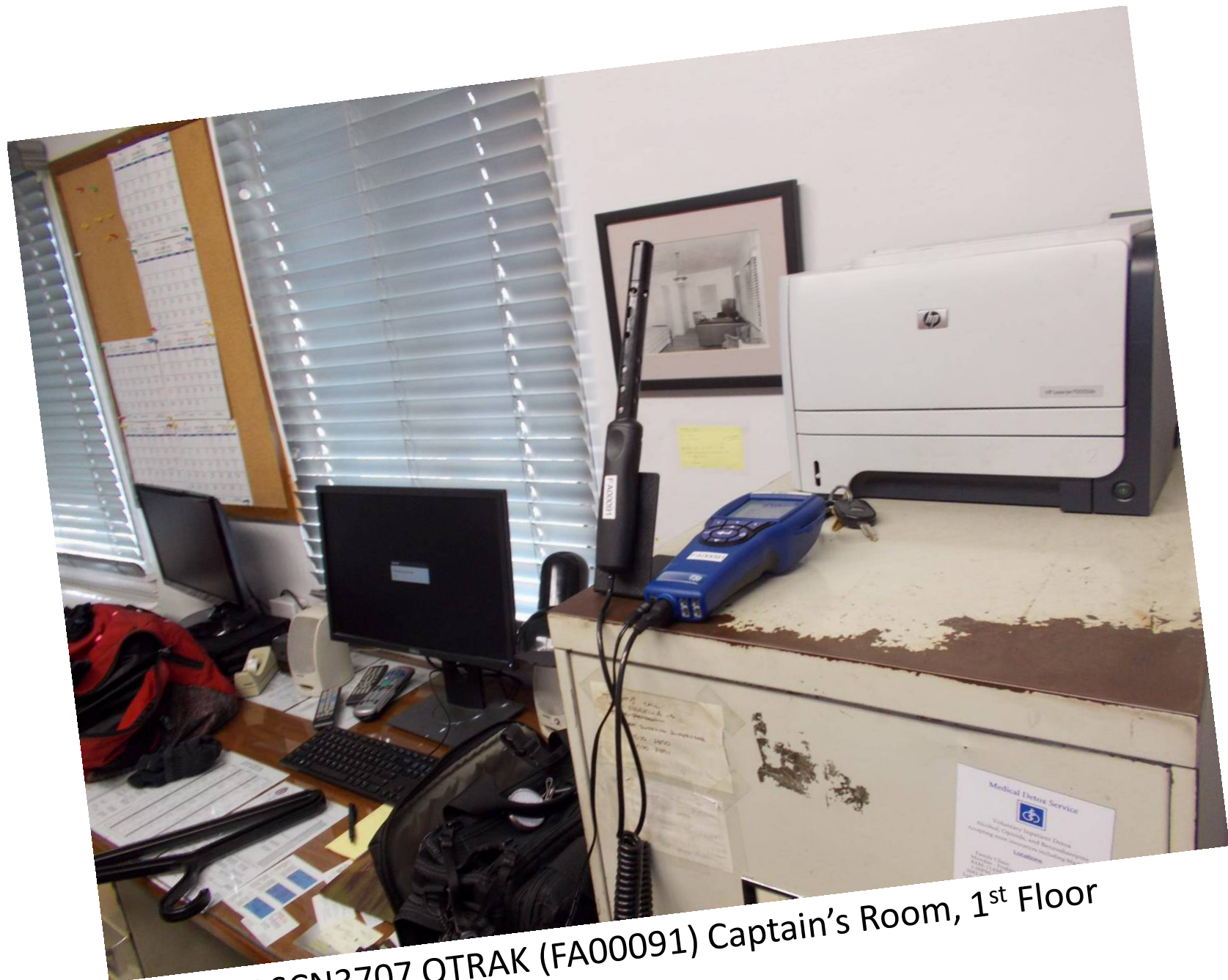


DSCN3705 QTRAK (FA01497) Room #3 2<sup>nd</sup> Floor





DSCN3706



DSCN3707 QTRAK (FA00091) Captain's Room, 1<sup>st</sup> Floor





DSCN3708 QTRAK (038180) Kitchen, 1<sup>st</sup> Floor



DSCN3709





DSCN3710 QTRAK (FA00101) Room #2 1<sup>st</sup> Floor



DSCN3711 QTRAK (FA00221) Outside





DSCN3712 Horizontal Surfaces Dusty/Grimy (white glove tests) in Locker Room



DSCN3713

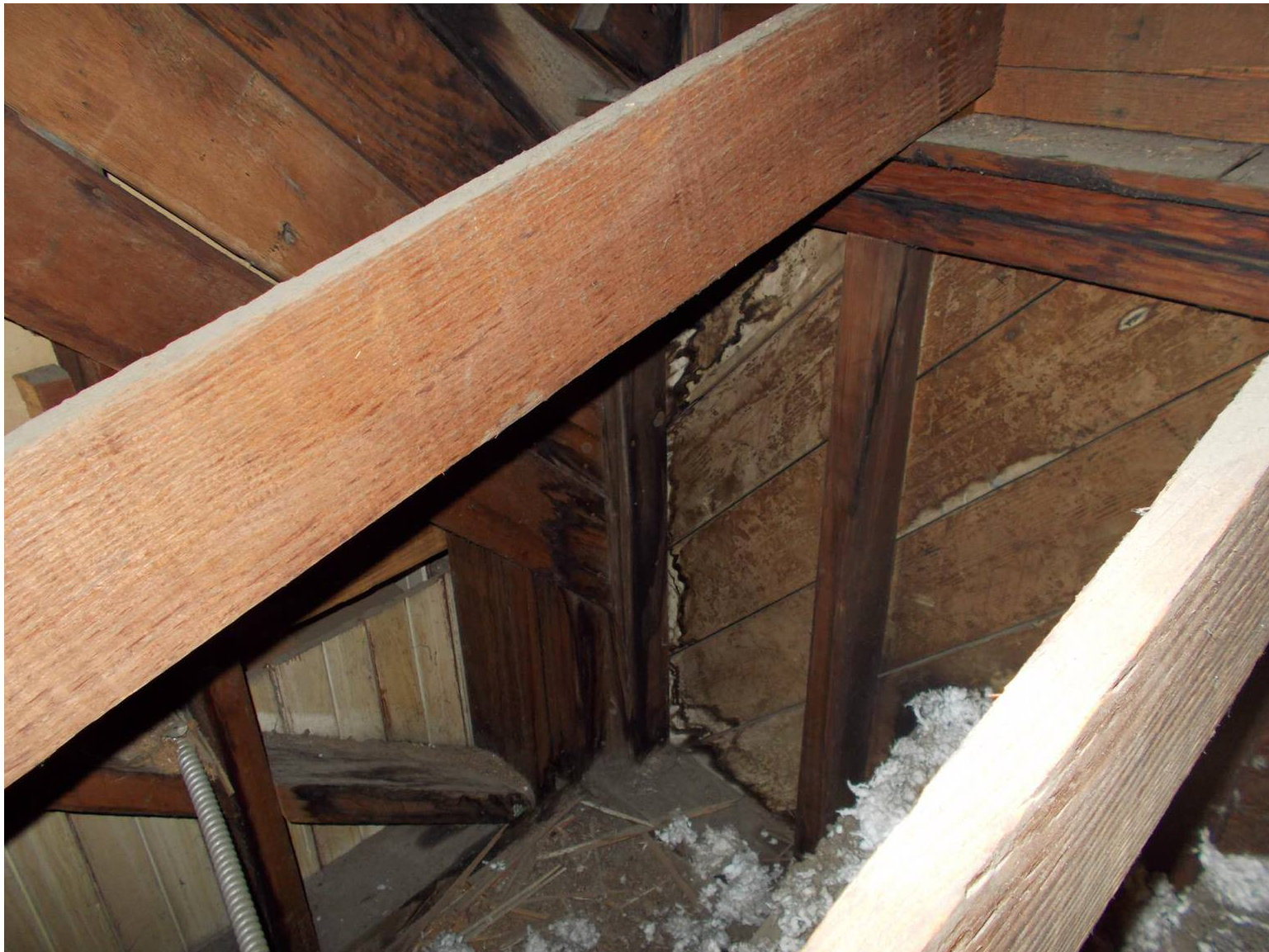




DSCN3714 Horizontal Surfaces Dusty/Grimy (white glove tests) in Bedroom #1 2<sup>nd</sup> Floor

# Photo Album

April 23, 2019



DSCN3715 Water stained areas throughout attic.





DSCN3716 Water stained areas throughout attic.





DSCN3718 Water stained areas throughout attic.





DSCN3720 Water stained areas throughout attic (dry).





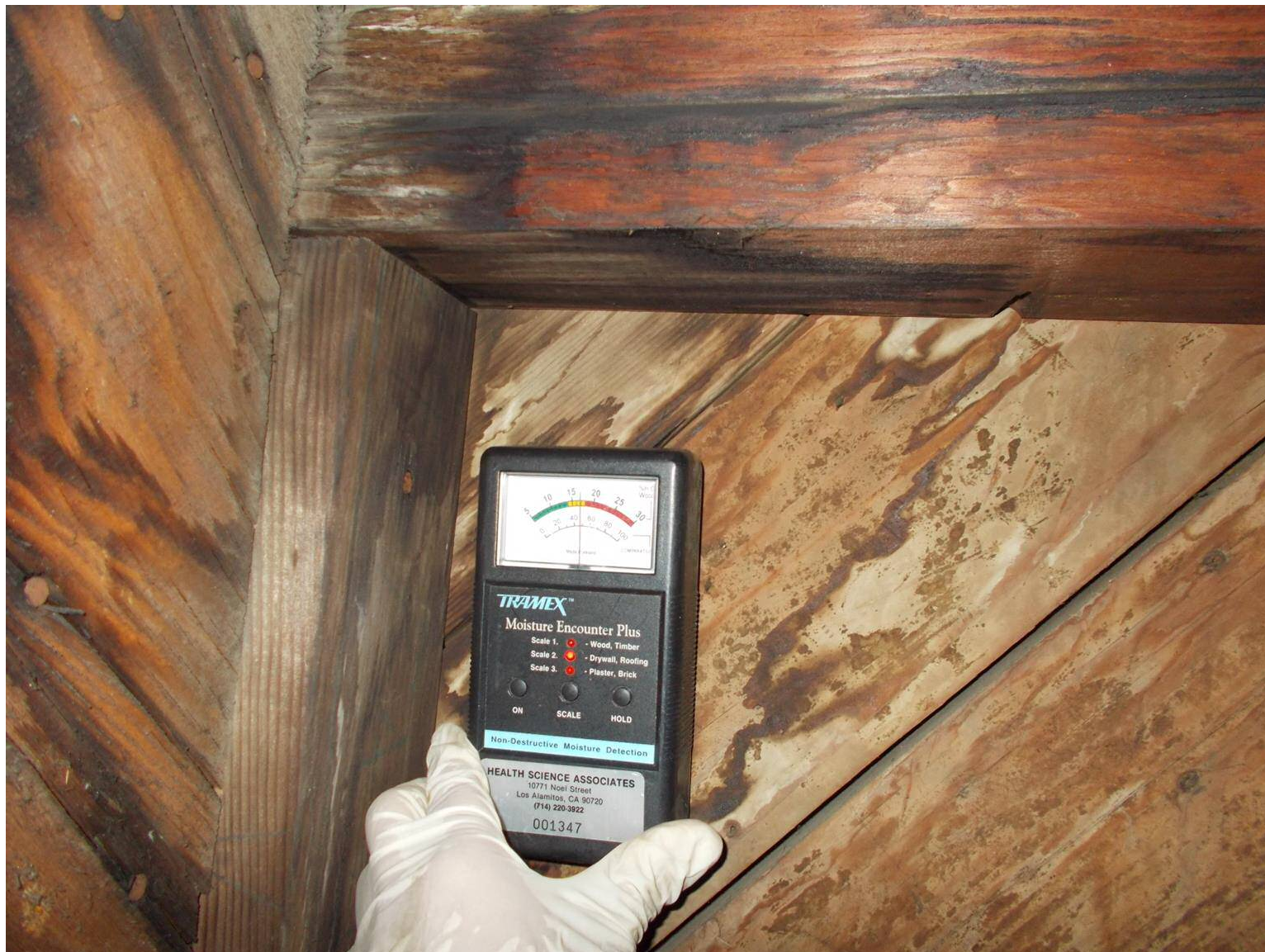
DSCN3721 Water stained areas throughout attic (dry).





DSCN3722 Water stained areas throughout attic (dry).





DSCN3723





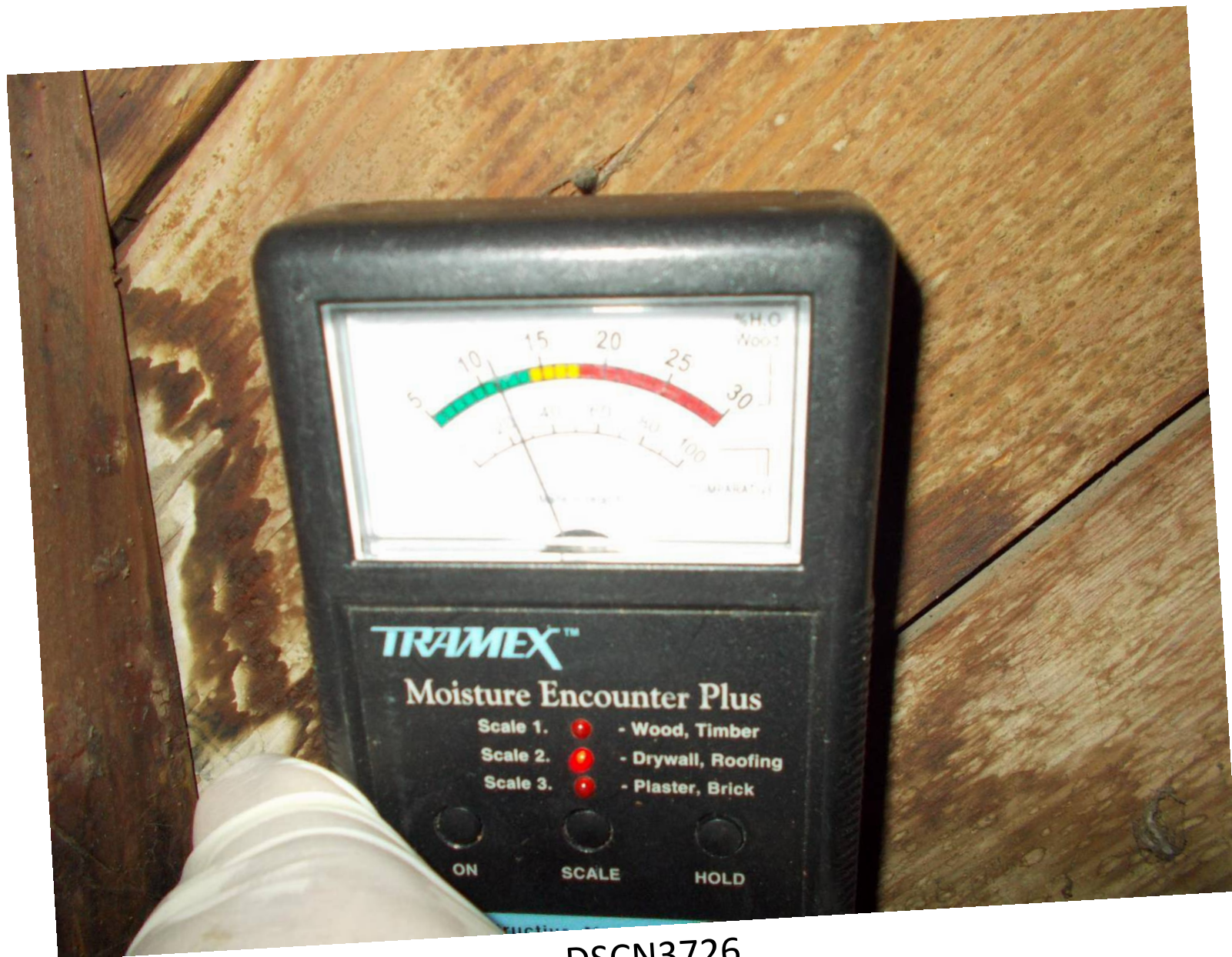
DSCN3724





DSCN3725





DSCN3726





DSCN3727





DSCN3728





DSCN3729



DSCN3730





DSCN3731

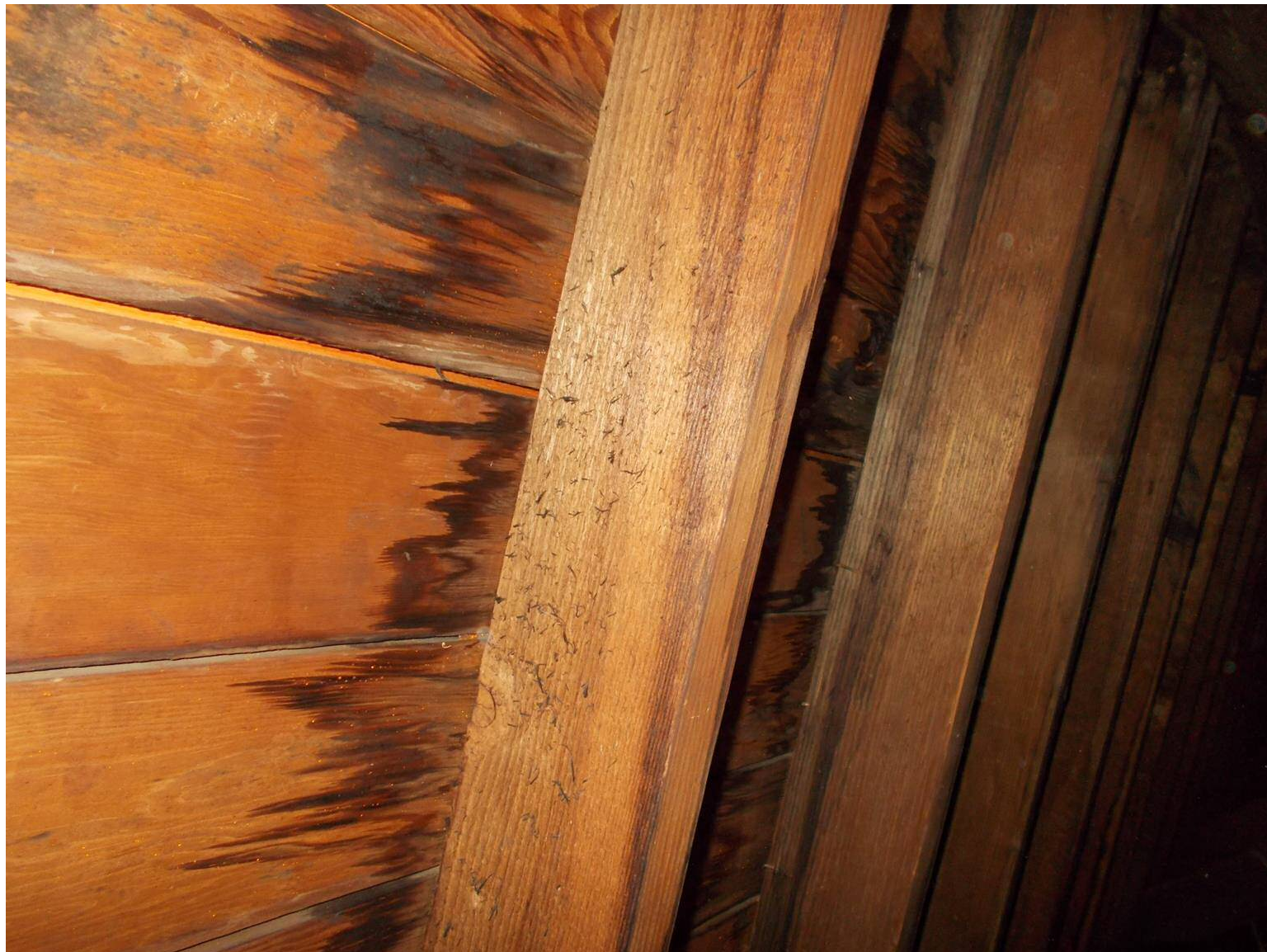


DSCN3732





DSCN3733



DSCN3734





DSCN3735



DSCN3736





DSCN3737





DSCN3738 Area above the kitchen





DSCN3739 Area above the kitchen



DSCN3740 Area above the kitchen (dry)





DSCN3742 Area above the kitchen (dry)





DSCN3743 Area above the kitchen (dry)



DSCN3744 Area above the kitchen (dry)





DSCN3745





DSCN3746 Dirty lumber from when the building was built.





DSCN3747





DSCN3748 Single 2x4 which was coated when building was built.



DSCN3749





DSCN3750 Water stained areas throughout attic.



DSCN3751 Dry





DSCN3753



DSCN3754 Dry





DSCN3755 Water stained areas throughout attic.





DSCN3756 Water stained areas throughout attic.



DSCN3757





DSCN3758





DSCN3759 Dry





DSCN3760





DSCN3761 Dry





DSCN3762





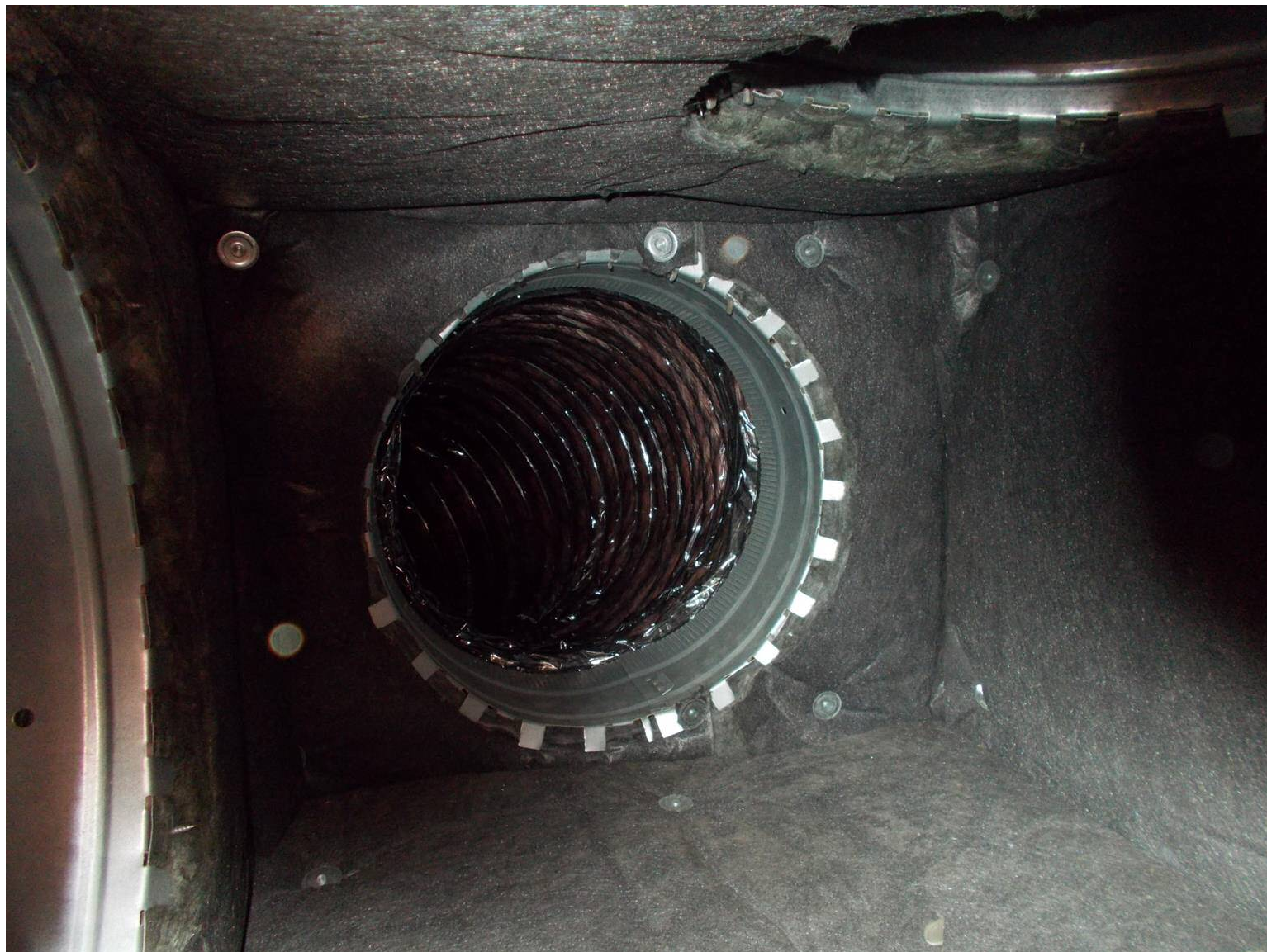
DSCN3763





DSCN3764



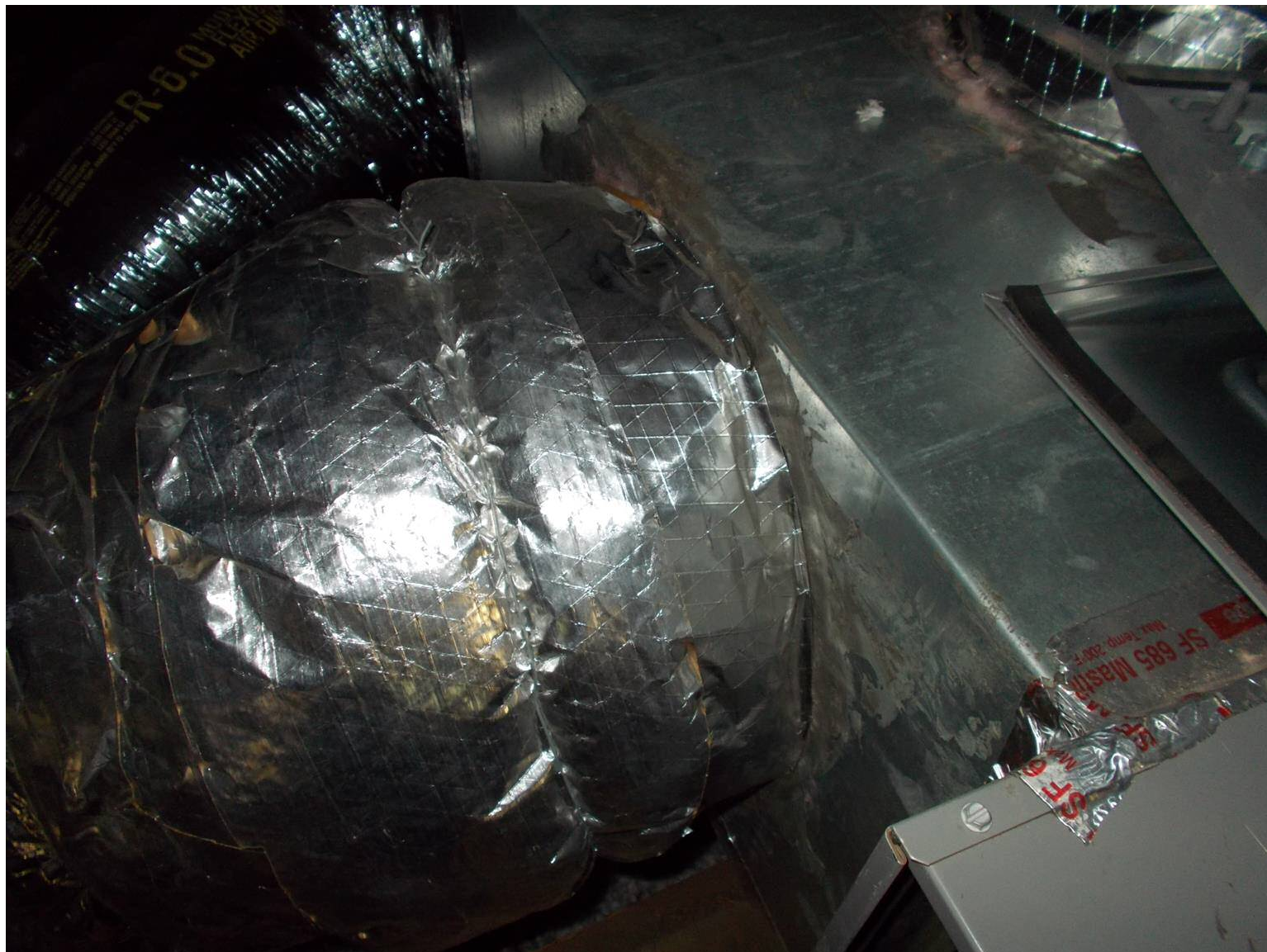


DSCN3765





DSCN3766



DSCN3767





DSCN3768



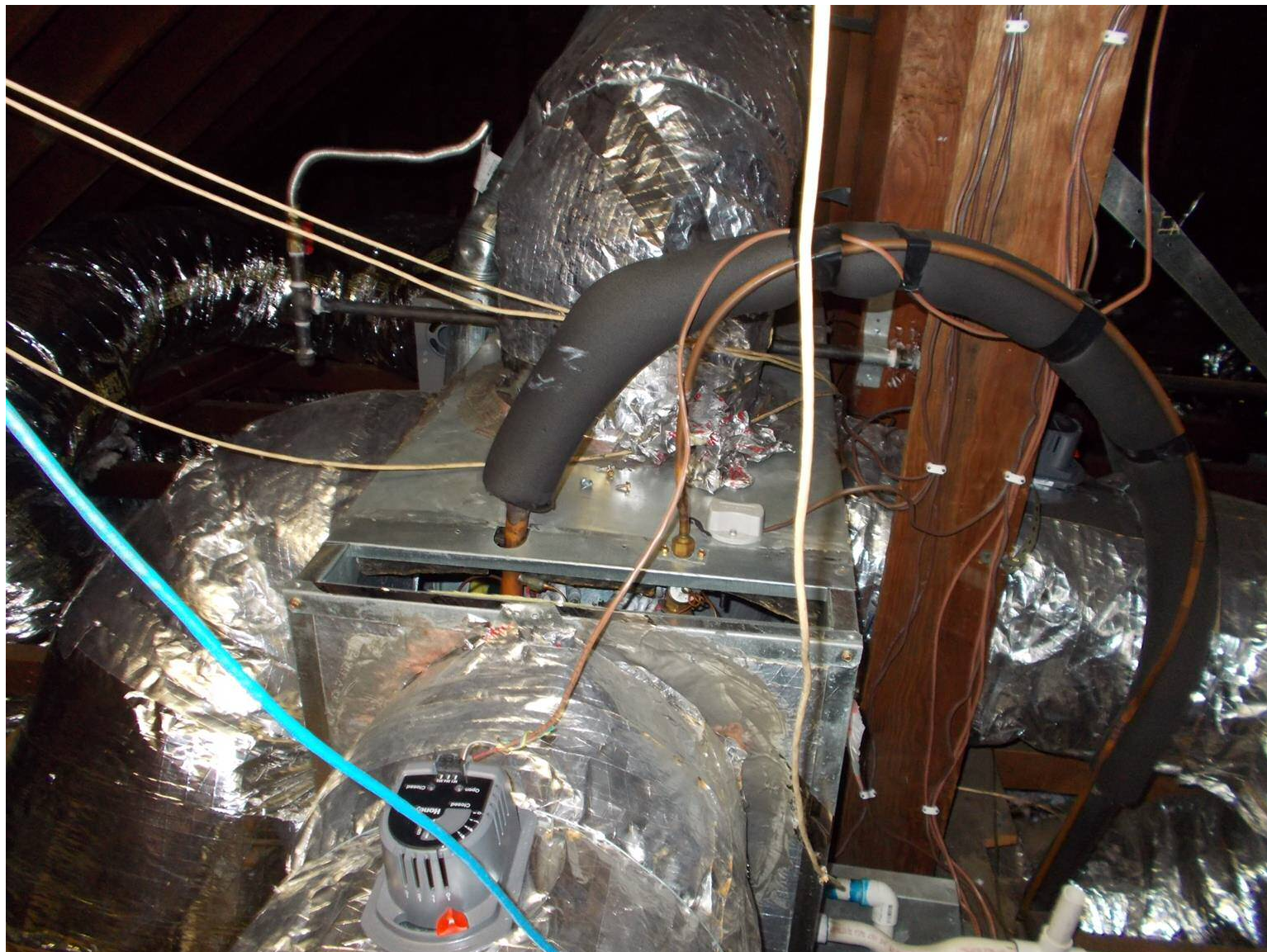
DSCN3769





DSCN3770





DSCN3771





DSCN3772





DSCN3773 Inside of HVAC unit was clean (like new).



DSCN3774



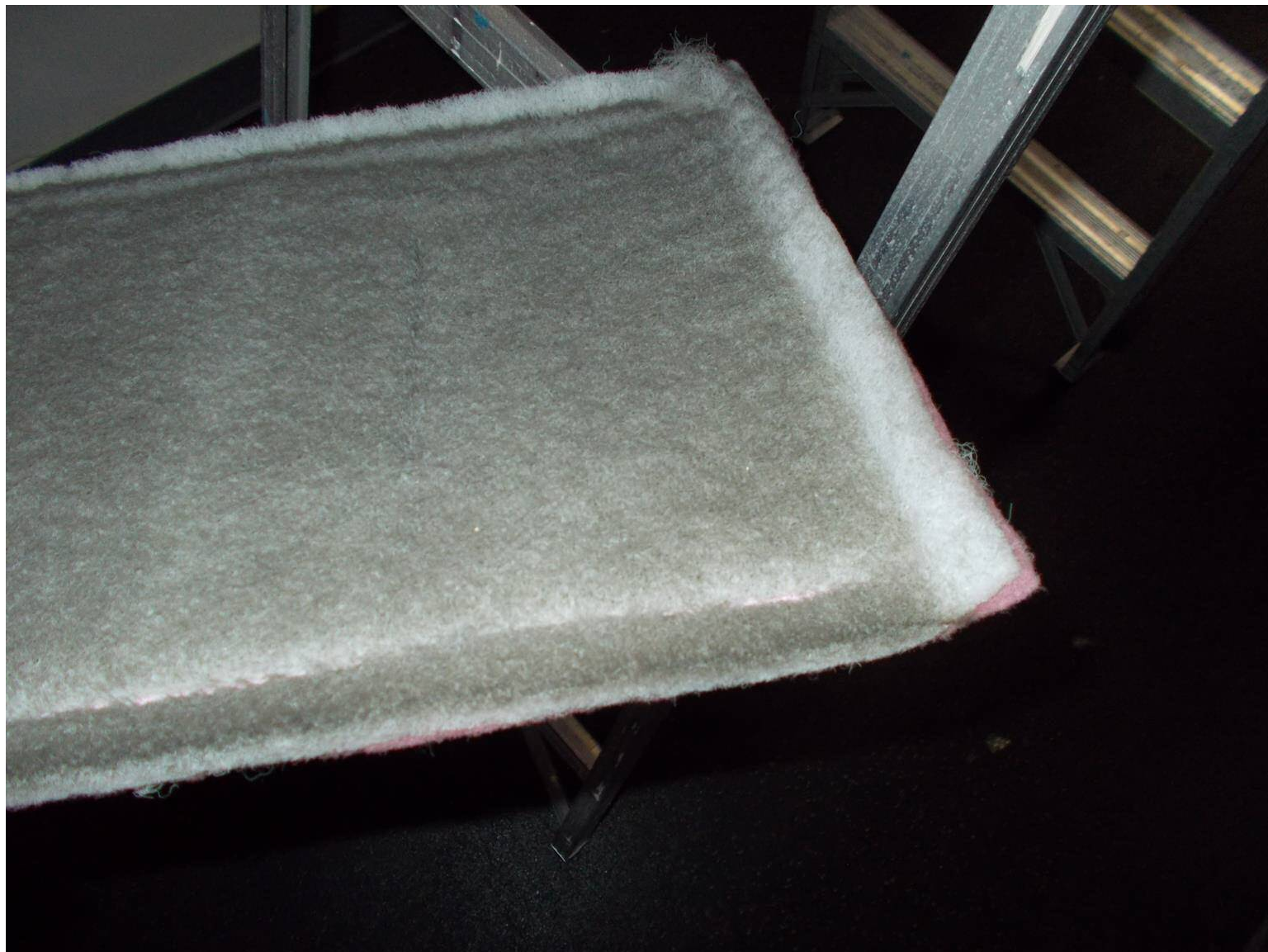


DSCN3775 Filter for HVAC.



DSCN3776





DSCN3777



DSCN3778





DSCN3779



DSCN3780



DSCN3781





DSCN3782





DSCN3783

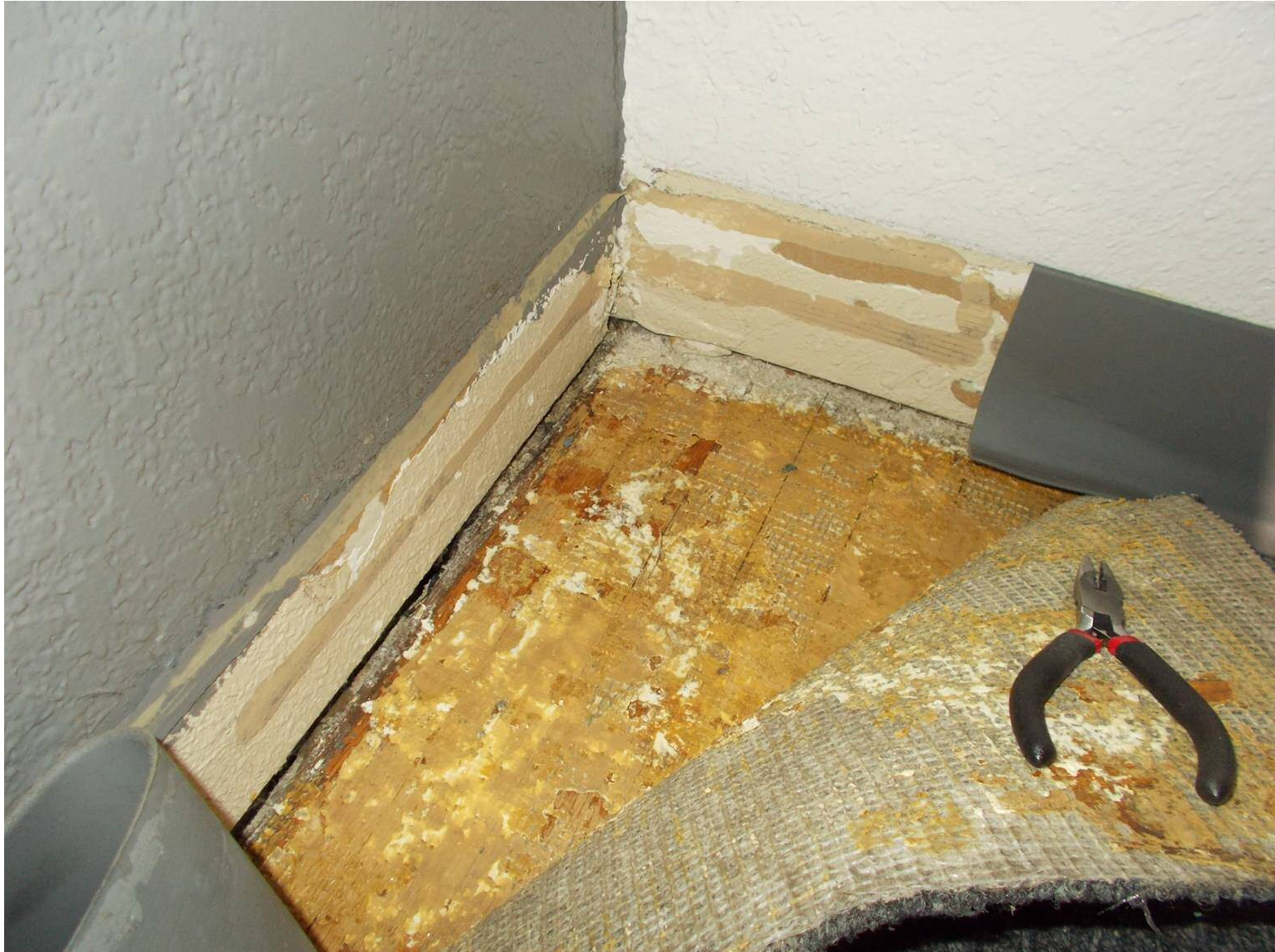


DSCN3784 Fresh air intake for HVAC disconnected.



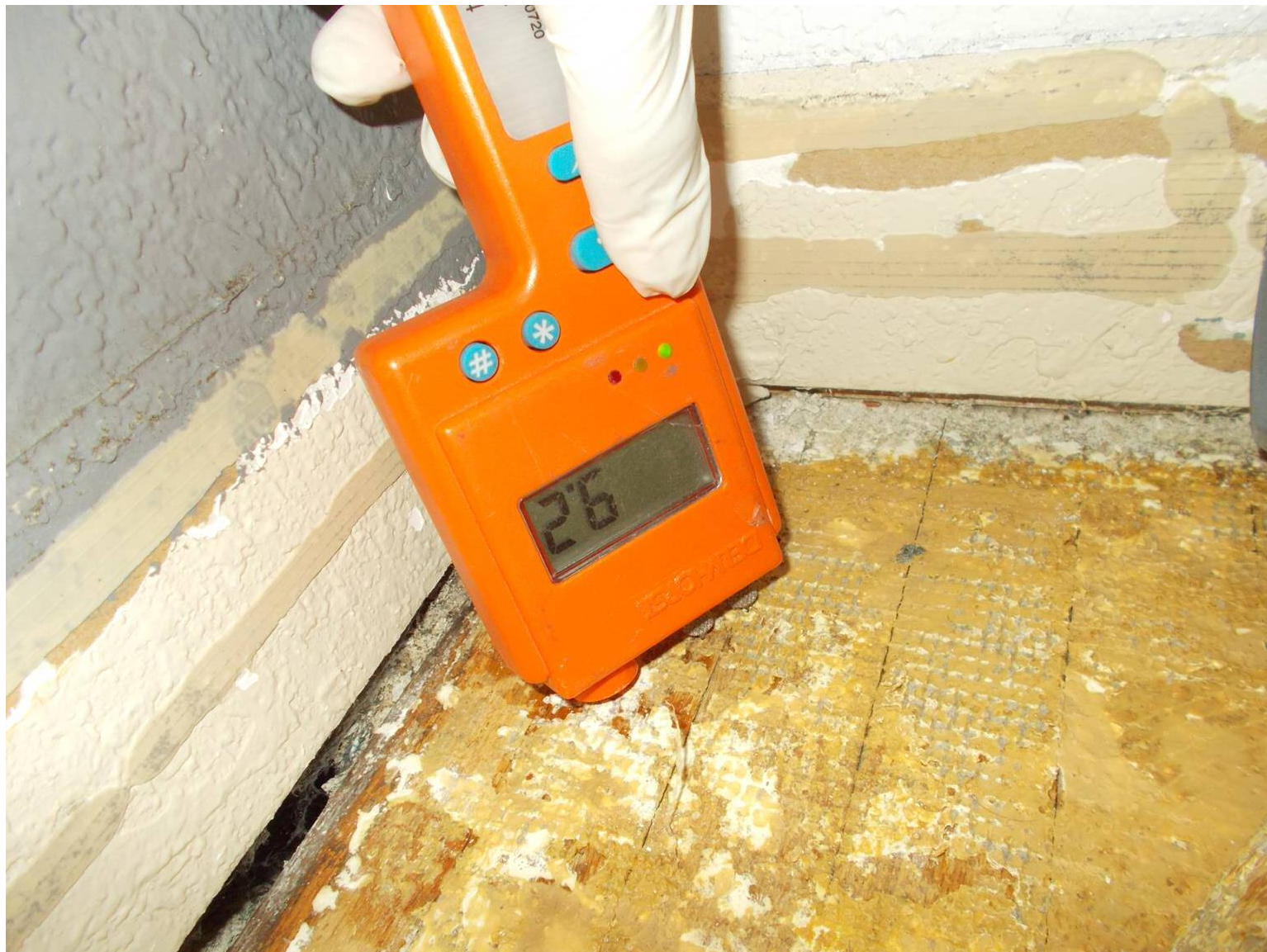


DSCN3785 1<sup>st</sup> Floor, Bedroom #2 Inspection around "Leaking Windows."



DSCN37861<sup>st</sup> Floor, Bedroom #2 Inspection around “Leaking Windows.”





DSCN3789 1<sup>st</sup> Floor, Bedroom #2 Inspection around "Leaking Windows."





DSCN3790 1<sup>st</sup> Floor, Bedroom #2 Inspection around "Leaking Windows."





DSCN3791 1<sup>st</sup> Floor, Bedroom #2 Inspection around "Leaking Windows."





DSCN3794 1<sup>st</sup> Floor, Bedroom #2 Inspection around “Leaking Windows.”



DSCN3795 1<sup>st</sup> Floor, Bedroom #2 Inspection around "Leaking Windows."





DSCN3796 1<sup>st</sup> Floor, Bedroom #2 Inspection around "Leaking Windows."





DSCN3797 1<sup>st</sup> Floor, Bedroom #2 Inspection around “Leaking Windows.”





DSCN3798 1<sup>st</sup> Floor, Bedroom #2 Inspection around “Leaking Windows.”



DSCN3799 1<sup>st</sup> Floor, Bedroom #2 Inspection around "Leaking Windows."





DSCN3800 1<sup>st</sup> Floor, Bedroom #2 Inspection around “Leaking Windows.”



DSCN3801 1<sup>st</sup> Floor, Bedroom #2 Inspection around "Leaking Windows."





DSCN3802 1<sup>st</sup> Floor, Bedroom #2 Inspection around "Leaking Windows."





DSCN3803 1<sup>st</sup> Floor, Bedroom #2 Inspection around “Leaking Windows.”



DSCN3804 1<sup>st</sup> Floor, Bedroom #2 Inspection around “Leaking Windows.”





DSCN3805 1<sup>st</sup> Floor, Bedroom #2 Inspection around "Leaking Windows."

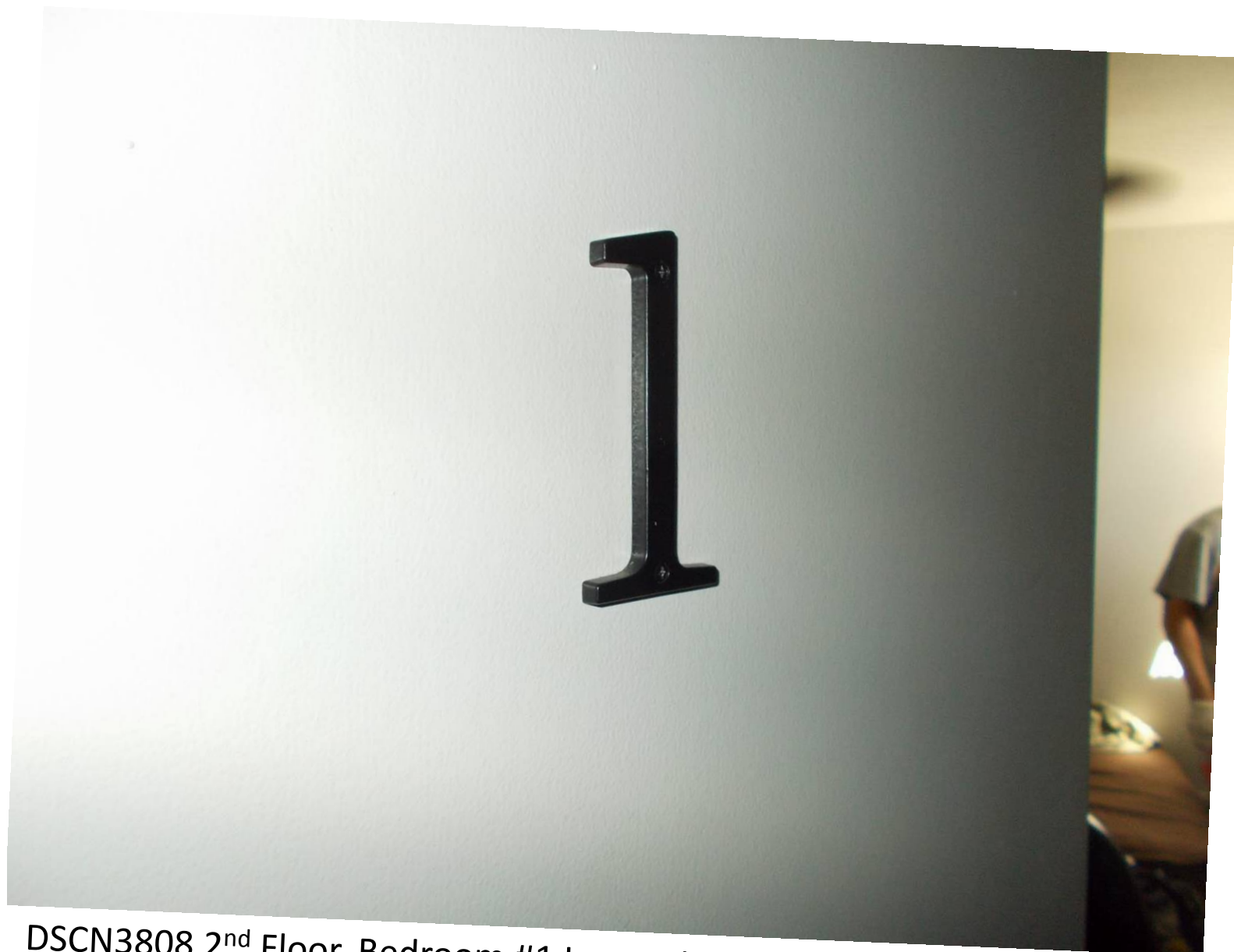


DSCN3806 1<sup>st</sup> Floor, Bedroom #2 Inspection around "Leaking Windows."





DSCN3807 1<sup>st</sup> Floor, Bedroom #2 Inspection around “Leaking Windows.”



DSCN3808 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."



DSCN3809 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."





DSCN3810 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."



DSCN3811 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."



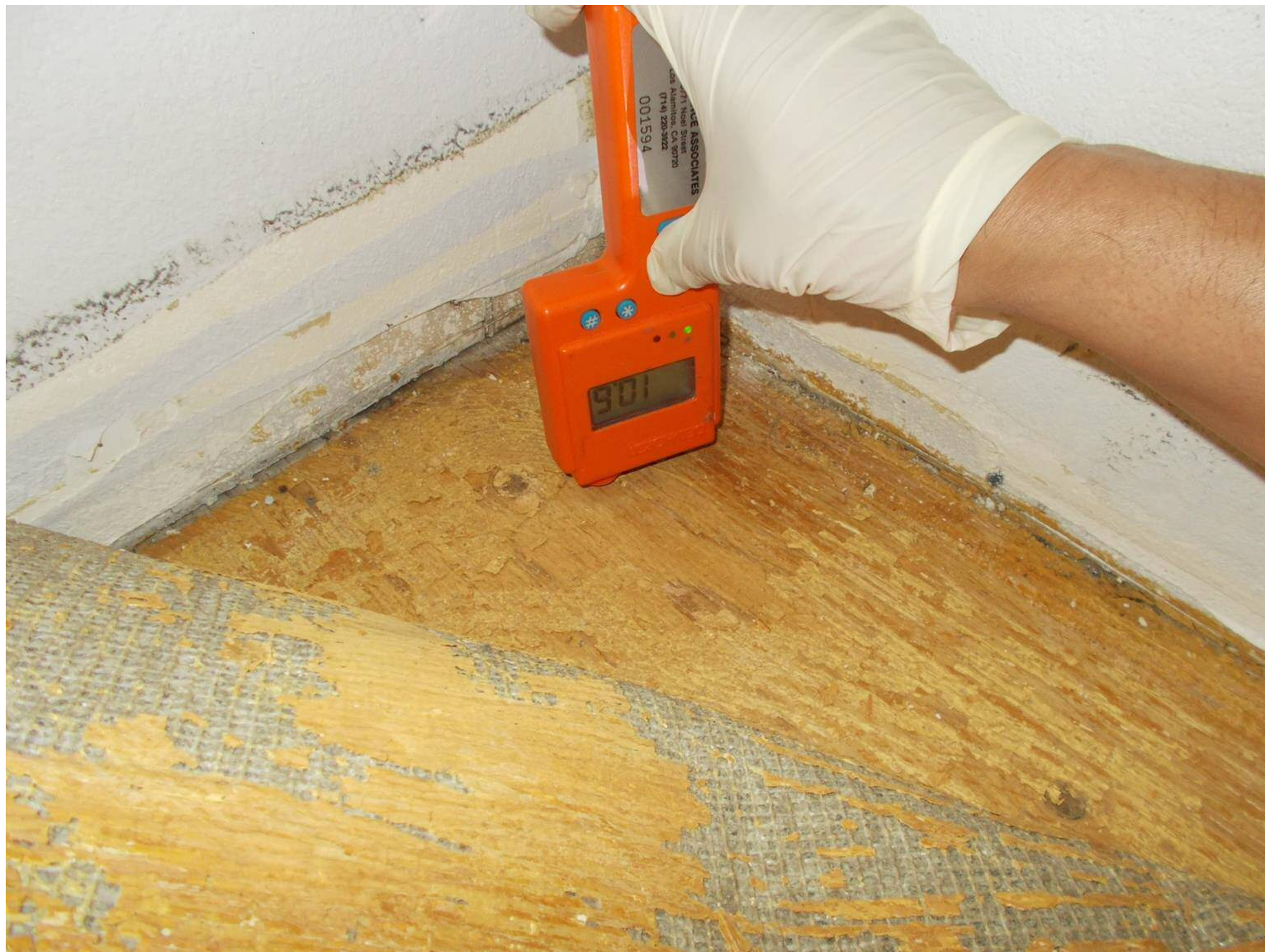


DSCN3812 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows." Dust on Wall.



DSCN3813 2<sup>nd</sup> Floor, Bedroom #1 Inspection around “Leaking Windows.”





DSCN3814 2<sup>nd</sup> Floor, Bedroom #1 Inspection around “Leaking Windows.”





DSCN3815 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."



DSCN3816 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."





DSCN3817 2<sup>nd</sup> Floor, Bedroom #1 Inspection around “Leaking Windows.”



DSCN3818 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."



DSCN3819 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."





DSCN3820 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."



DSCN3821 2<sup>nd</sup> Floor, Bedroom #1 Inspection around “Leaking Windows.”





DSCN3822 2<sup>nd</sup> Floor, Bedroom #1 Inspection around “Leaking Windows.”



DSCN3823 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."





DSCN3824 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."



DSCN3825 2<sup>nd</sup> Floor, Bedroom #1 Inspection around “Leaking Windows.”





DSCN3826 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."





DSCN3827 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."



DSCN3828 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."





DSCN3829 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."



DSCN3830 2<sup>nd</sup> Floor, Bedroom #1 Inspection around “Leaking Windows.”





DSCN3831 2<sup>nd</sup> Floor, Bedroom #1 Inspection around "Leaking Windows."





DSCN3832 2<sup>nd</sup> Floor, Bedroom #1 Inspection around “Leaking Windows.”



DSCN3833 Inspection of crawlspace.





DSCN3834 Inspection of crawlspace.





DSCN3835 Inspection of crawlspace.



DSCN3836 Inspection of crawlspace.





DSCN3838 Inspection of crawlspace.





DSCN3840 Inspection of crawlspace.





DSCN3841 Inspection of crawlspace.



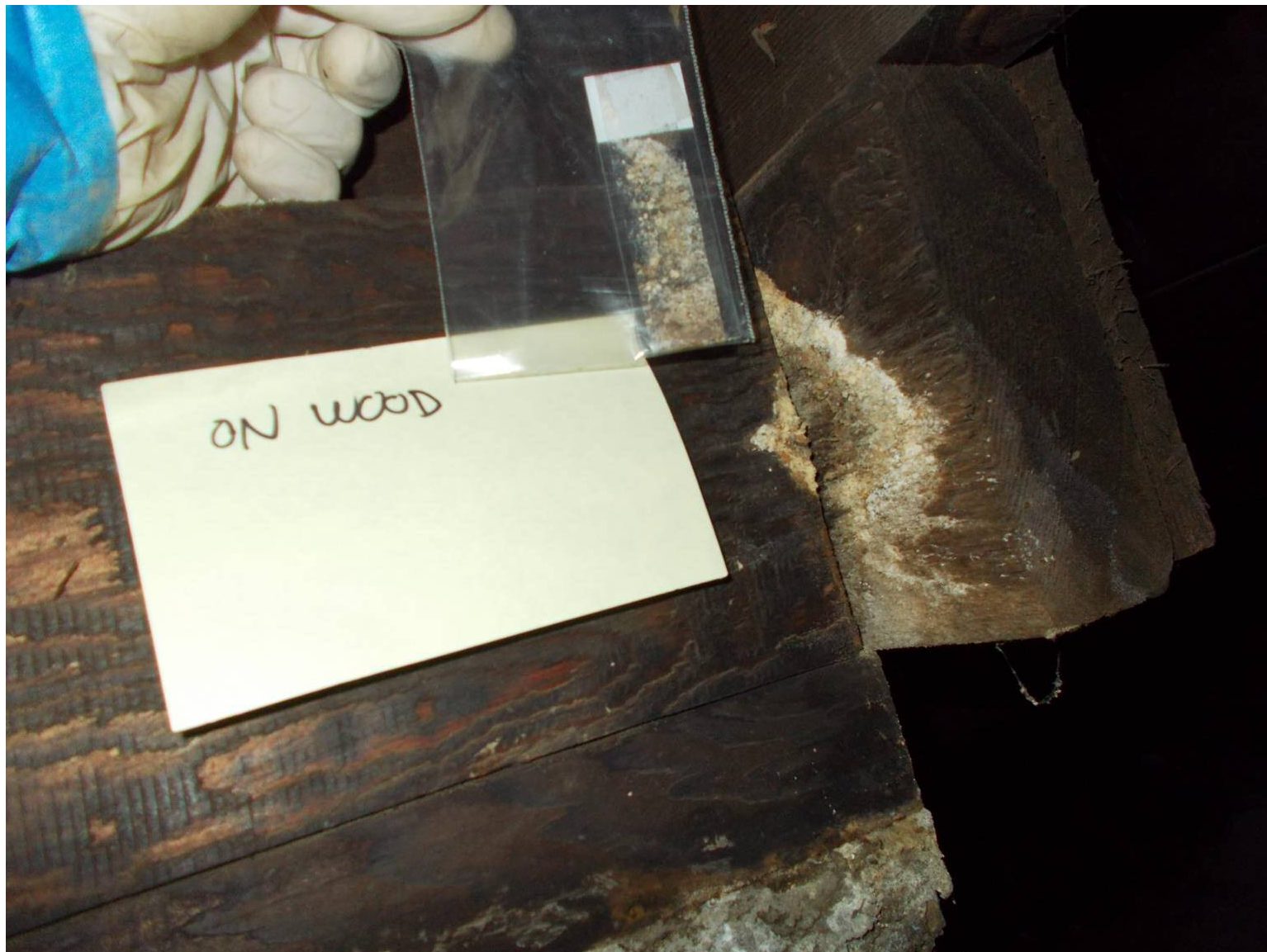
DSCN3843 Inspection of crawlspace. Wet





DSCN3844 Inspection of crawlspace.





DSCN3845 Inspection of crawlspace.



DSCN3846 Inspection of crawlspace.





DSCN3847 Inspection of crawlspace.



DSCN3848 Inspection of crawlspace.





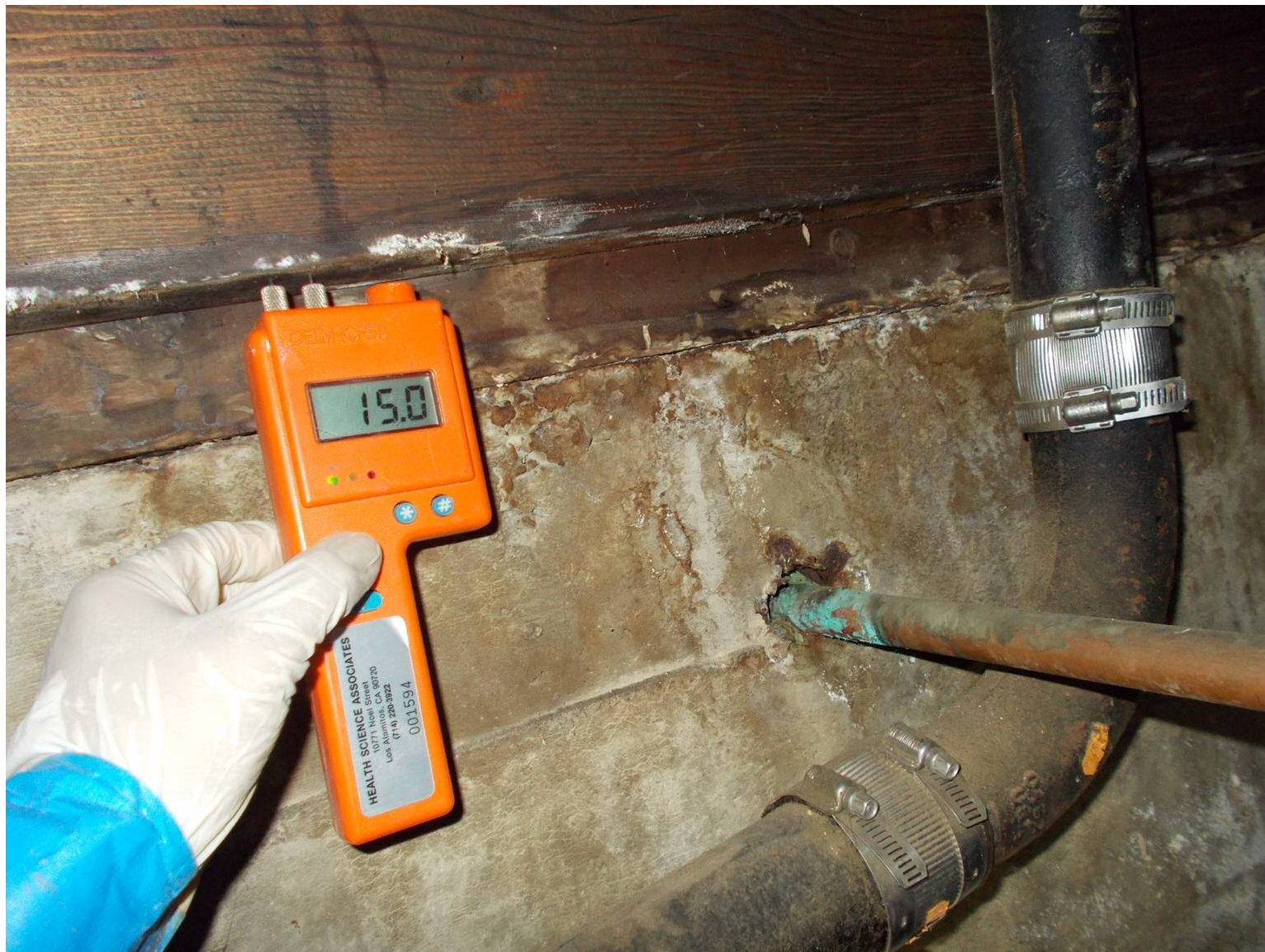
DSCN3849 Inspection of crawlspace.





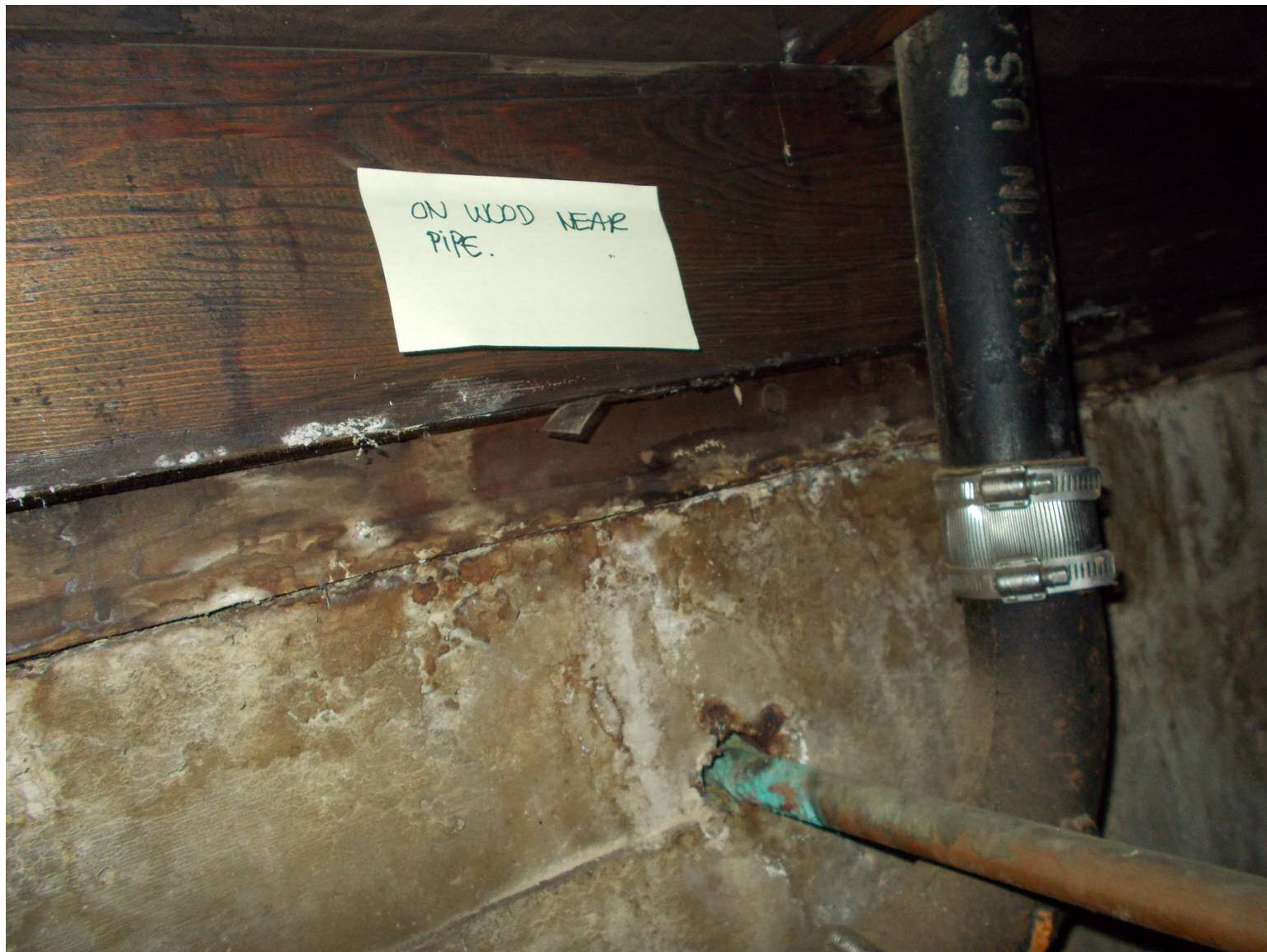
DSCN3850 Inspection of crawlspace. Dry





DSCN3853 Inspection of crawlspace. Dry





DSCN3855 Inspection of crawlspace.



DSCN3856 Inspection of crawlspace.





DSCN3857 Inspection of crawlspace.





DSCN3858 Inspection of crawlspace.



DSCN3859 Inspection of crawlspace.





DSCN3860 Inspection of crawlspace.





DSCN3861 Inspection of crawlspace.





DSCN3862 Inspection of crawlspace.





DSCN3863 Inspection of crawlspace.





DSCN3864 Inspection of crawlspace.





DSCN3866 Inspection of crawlspace. Dry (marginal yellow)



DSCN3868 Inspection of crawlspace. Dry (marginal yellow)





DSCN3869 Inspection of building perimeter. Crawlspace vent clogged with leaves.





DSCN3870 Holes in building not sealed.





DSCN3871 Holes in building not sealed.



DSCN3872 Holes in building not sealed. Rain spout missing catch.





DSCN3873 Holes in building not sealed. Drainage not correct.





DSCN3874





DSCN3875 Drainage issues.





DSCN3876 Drainage issues.





DSCN3877





DSCN3878





DSCN3879 Deteriorating stucco.





DSCN3880 Deteriorating stucco.





DSCN3881 Gutter drain on side of building.



DSCN3882





DSCN3883 Particle Count meter



DSCN3884Particle Count meter



## *Facility Condition Assessment*

## Facility Condition Assessment

For  
City of Long Beach  
Fire Station 9  
3917 Long Beach Blvd  
Long Beach ,  
CA 90807

# CITY OF LONG BEACH



Date of Report: December 19, 2019

Provided By:

**Faithful+Gould, Inc.**

Provided For:

Long Beach

FAITHFUL  
GOULD

Member of the SNC-Lavalin Group



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# EXECUTIVE SUMMARY

## Introduction

In accordance with the contract held between The City of Long Beach and Faithful+Gould Inc, this completed report provides a comprehensive Facility Condition Assessment of the Fire Station 9 located at 3917 Long Beach Blvd , Long Beach , CA, 90807 (The Property).

This report provides a summary of the facility information known to us at the time of the study, the scope of work performed, an equipment inventory, evaluation of the visually apparent condition of The Property together with a forecast of capital expenditures anticipated over the next 10 years. The expenditure forecast does not account for typical preventative maintenance items such as changing filters to fan coil units.

Our cost rates to produce life cycle and replacement cost estimates are based on our knowledge of the local regional market rates and the RS Means Cost Database benchmarking. Our line item costs assume that the work will be procured through public general contractor bids. Capital expenditure pricing includes an uplift of 45% to allow for professional fees, general contractor overhead/profit, management costs, adherence with the California Prevailing Wage Law, permitting, etc.

This report provides a summary of the anticipated primary expenditures over the 10-year study period. Further details of these expenditures are included within each respective report section and within the 10-year expenditure forecast, in Appendix A.

The report also calculates the Current Facility Condition Needs Index (FCNI) which is used in Facilities Management to provide a benchmark to compare the relative condition of a group of facilities. The FCNI is a snapshot of the **current** condition of the building. Future conditions of the building, known as the FCI are also presented. The FCNI and FCI scores are primarily used to support asset management initiatives of federal, state, and local government facilities organizations.

## Limiting Conditions

This report has been prepared for the exclusive and sole use of the City of Long Beach . The report may not be relied upon by any other person or entity without the express written consent of Faithful+Gould .

Any reliance on this report by a third party, any decisions that a third party makes based on this report, or any use at all of this report by a third party is the responsibility of such third parties. Faithful+Gould accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made, or actions taken, based on this report.

The assessment of the building/site components was performed using methods and procedures that are consistent with standard commercial and customary practice as outlined in ASTM Standard E 2018-015 for PCA assessments. As per this ASTM Standard, the assessment of the building/site components is based on a visual walk-through site visit, which captured the overall condition of the site at that specific point in time only.

No legal surveys, soil tests, environmental assessments, geotechnical assessments, detailed barrier-free compliance assessments, seismic assessments, detailed engineering calculations, or quantity surveying compilations have been made. No responsibility, therefore, is assumed concerning these matters. Faithful+Gould did not design or construct the building(s) or related structures and therefore will not be held responsible for the impact of any design or construction defects, whether or not described in this report. No guarantee or warranty, expressed or implied, with respect to the property, building components, building systems, property systems, or any other physical aspect of The Property is made.

The recommendations and our opinion of probable costs associated with these recommendations, as presented in this report, are based on walk-through non-invasive observations of the parts of the building which were readily accessible during our visual review. Conditions may exist that are not as per the general condition of the system being observed and reported in this document. Opinions of probable costs presented in this report are also based on information received during interviews with operations and maintenance staff. In certain instances,



Faithful+Gould has been required to assume that the information provided is accurate and cannot be held responsible for incorrect information received during the interview process. Should additional information become

available with respect to the condition of the building and/or site elements, Faithful+Gould requests that this information be brought to our attention so that we may reassess the conclusions presented herein.

The opinions of probable costs are intended for global budgeting purposes only. Faithful+Gould has no control over the cost of labor and materials, general contractor's or any subcontractor's method of determining prices, or competitive bidding and market conditions. The data in this report represent an opinion of probable cost of construction and is made on the basis of the experience, qualifications, and best judgment of the professional consultant familiar with the construction industry. Faithful+Gould cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from this or subsequent Cost Estimates. The scope of work and the actual costs of the work recommended can only be determined after a detailed examination of the site element in question, understanding of the site restrictions, understanding of the effects on the ongoing operations of the site/building, definition of the construction schedule, and preparation of tender documents.

## Project Details

On June 12th, 2019, Scott Edson of Faithful+Gould visited The Property to observe and document the condition of the building and site components. During our site visit, Faithful+Gould was assisted by Cory Fackiner (Battalion Chief ) and ( ) who are associated with City of Long Beach .

## Building Details

Item	Description
Project Name	Fire Station 9
Property Type	
Full Address	3917 Long Beach Blvd Long Beach , CA 90807
Onsite Date	June 12th, 2019
Historic District	No
Historic Building	No
Year Built	1938
Occupancy Status	Occupied
Number of Stories	2
Gross Building Area (GSF)	5,548
Current Replacement Value (CRV)	\$4,161,000
CRV/GSF (\$/Sq Ft)	\$750.00 / Sq Ft





## Building Description

### Property Executive Summary

The two-story Fire Station #9 facility occupies 5548 square feet and is located at 3917 Long Beach Blvd. in Long Beach, CA and has been serving the community since 1938. The Fire Station has been closed down due to environmental issues.

### Architectural Executive Summary

The building envelope is comprised of cast-in-place concrete footings supporting a wood frame superstructure with an exterior finish of painted plywood sheathing and painted masonry veneer. Exterior openings include motorized overhead doors and single solid core wood doors. The wood roof structure assembly is finished with a built-up roof at the low sloped portions and asphalt shingles at the pitched areas. Roof openings include a plastic skylight. Roof drainage is provided via galvanized steel gutters and downspouts. ##### Interior partitions are comprised of painted Gypsum Wall Board (GWB) mechanically affixed to wood studs and contain multiple solid core wood doors along with a single full glass frameless door. Floor finishes include vinyl sheet, rubber sheet, broadloom carpet and clear sealer at the concrete floors. Ceilings are finished with painted GWB. Fixed furnishings include base cabinets, wall cabinets and stainless-steel countertops.

### Mechanical Executive Summary

Plumbing fixtures include floor mounted water closets, pedestal as well as vanity top lavatories, a wall mounted service sink, a two-compartment stainless steel sink, a fiberglass shower and a ceramic tile shower. Domestic hot water service is provided by a 100 Gallon A. O. Smith gas fired water heater. Heating and cooling are provided by a 5 Ton Ruud split system, a 2 Ton Samsung split system and a 20 MBH gas fired unit heater in the apparatus room. There is no fire suppression present.

### Electrical Executive Summary

Primary power to the building is provided via a 120/240-volt 250 Amp switchboard. Lighting is provided via fluorescent fixtures at the interior and wall packs at the exterior. There is no Fire Alarm Control Panel (FACP) present.





## Summary of Findings

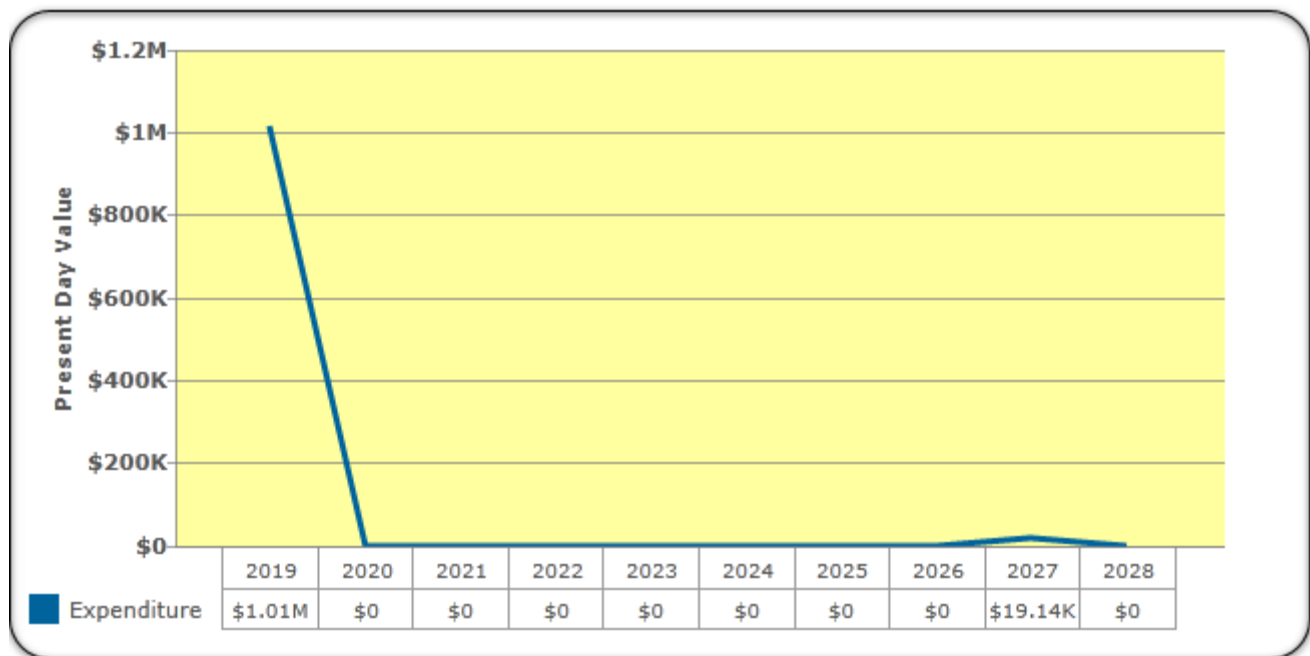
This report represents summary-level findings for the Facility Condition Assessment. The deficiencies identified in this assessment can be combined to develop an overall Long-Term Capital Needs Plan that can be the basis for a facility wide capital improvement funding strategy. Key findings from the Assessment include:

Key Findings	Metric
Current Year Facility Condition Needs Index	<b>24.32 %</b>
Immediate Capital Needs (Year 1) (included in FCNI)	<b>\$1,011,957</b>
Future Capital Needs (FCI) (Year 2 to Year 10)	<b>\$19,136</b>

## Building Expenditure Summary

The building expenditure summary section provides an executive overview of the findings from the assessment. The chart below provides a summary of yearly anticipated expenditures over the study period for the Fire Station 9 building. In addition, we have scheduled key findings highlighting items greater than \$5,000 and their anticipated failure year. Further details of these expenditures are included within each respective report section and within the expenditure forecast, in Appendix A of this report. The results illustrate a total anticipated expenditure over the study period of approximately \$1,031,093.

**Expenditure Forecast Over Study Period**





## Key Findings

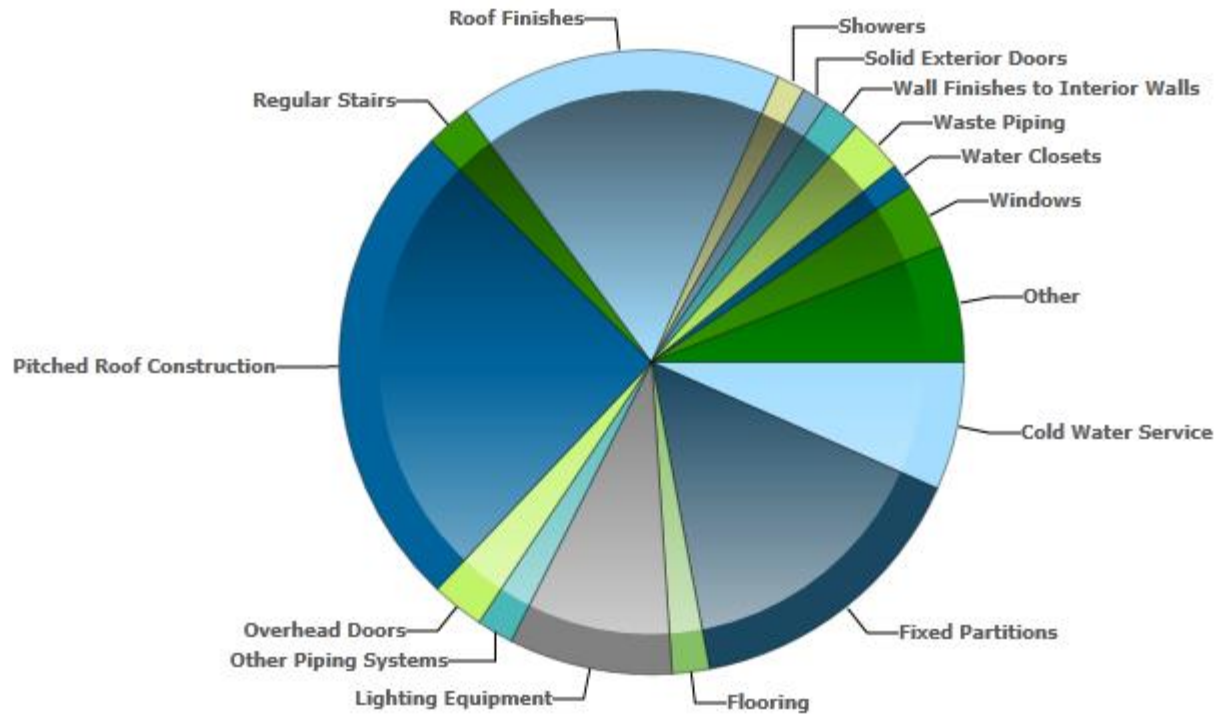
- + A SubStructure: Structural Engineer at an estimated cost of \$5,000 in year 2019
- + B Shell: Perimeter Caulking to Windows and Replace Window Cills at an estimated cost of \$35,000 in year 2019
- + B Shell: Replace Single Solid Core Wood Doors at an estimated cost of \$13,825 in year 2019
- + B Shell: Replace Rolling Overhead Doors, Electric at an estimated cost of \$27,649 in year 2019
- + B Shell: Replace Traditional Wood Beams and Rafters at an estimated cost of \$257,920 in year 2019
- + B Shell: Replace Asphalt Shingle Roof at an estimated cost of \$152,555 in year 2019
- + B Shell: Replace BUR (Built-up Roofing) Covering at an estimated cost of \$17,018 in year 2019
- + B Shell: Repaint Exterior Wall Surfaces at an estimated cost of \$9,243 in year 2019
- + C Interiors: Environmental Abatement at an estimated cost of \$60,000 in year 2019
- + C Interiors: Replace Regular Stairs - Wood Construction at an estimated cost of \$23,701 in year 2019
- + C Interiors: Replace Toilet Partition at an estimated cost of \$7,681 in year 2019
- + C Interiors: Replace Broadloom Standard without Padding at an estimated cost of \$5,208 in year 2019
- + C Interiors: Replace Rubber Sheet at an estimated cost of \$15,753 in year 2019
- + C Interiors: Replace Gypsum Wall Board Stud Walls at an estimated cost of \$95,857 in year 2019
- + C Interiors: Replace Painted Finish - Standard at an estimated cost of \$19,136 in year 2019
- + C Interiors: Paint Ceiling at an estimated cost of \$5,703 in year 2019
- + C Interiors: Replace Painted Finish - Standard at an estimated cost of \$19,136 in year 2027
- + D Services: Replace Air Compressor at an estimated cost of \$19,202 in year 2019
- + D Services: Replace Service Sink Wall Mounted at an estimated cost of \$6,615 in year 2019
- + D Services: Replace Shower - Three Wall Fiberglass at an estimated cost of \$6,087 in year 2019
- + D Services: Replace Floor Mounted Water Closets at an estimated cost of \$13,230 in year 2019
- + D Services: Replace Shower - Three Wall Ceramic Tile at an estimated cost of \$8,641 in year 2019
- + D Services: Replace Pedestal Mounted Lavatories at an estimated cost of \$6,248 in year 2019
- + D Services: ECM 002 Update Interior Lighting to Energy Efficient Lighting at an estimated cost of \$85,661 in year 2019
- + D Services: Replace Cold Water Distribution at an estimated cost of \$67,109 in year 2019
- + D Services: Replace Sanitary Water Gravity Discharge at an estimated cost of \$28,777 in year 2019

1. All costs presented in present day values
2. Costs represent total anticipated values over the 10-year study period
3. The Key Findings above represent expenditures of **\$5,000 or above only**. For a full list of expenditures, please refer to Appendix A of this report



## Distribution of Immediate (Year 1) Needs by Building System

**Distribution of Immediate Needs by Building System**





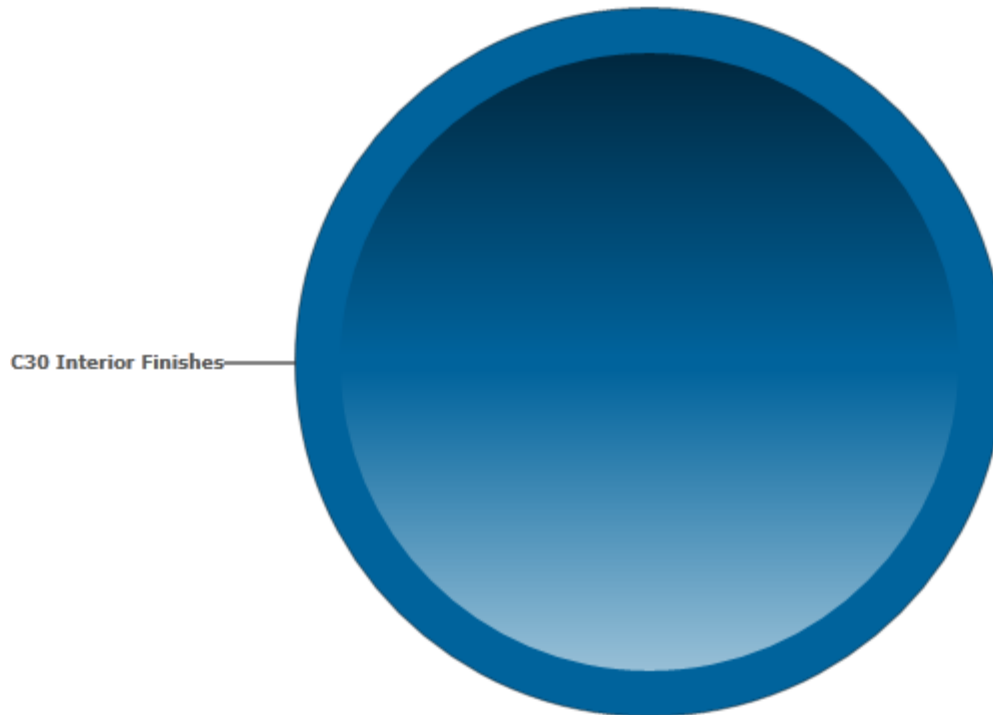
Building System	Estimated Cost	Percentage of Total Cost
Carpeting	\$5,208	0.5%
Ceiling Finishes	\$5,703	0.6%
Cold Water Service	\$67,109	6.6%
Exterior Wall Construction	\$9,243	0.9%
Fixed Partitions	\$155,857	15.4%
Flooring	\$19,533	1.9%
Gutters and Downspouts	\$2,375	0.2%
Interior Doors	\$1,067	0.1%
Lavatories	\$9,004	0.9%
Lighting Equipment	\$85,661	8.5%
Other Piping Systems	\$19,202	1.9%
Overhead Doors	\$27,649	2.7%
Pitched Roof Construction	\$257,920	25.5%
Regular Stairs	\$23,701	2.3%
Roof Finishes	\$169,573	16.8%
Showers	\$14,728	1.5%
Sinks	\$6,615	0.7%
Site Built Toilet Partitions	\$7,681	0.8%
Solid Exterior Doors	\$13,825	1.4%
Standard Slab on Grade	\$5,000	0.5%
Terminal Self-Contained Units	\$4,416	0.4%
Urinals	\$4,743	0.5%
Wall Finishes to Interior Walls	\$19,136	1.9%
Waste Piping	\$28,777	2.8%
Water Closets	\$13,230	1.3%
Windows	\$35,000	3.5%
<b>Total</b>	<b>\$1,011,957</b>	<b>100%</b>





## Distribution of Future (Year 2 – Year 10) Needs by Building System

### Distribution of Capital Needs by Building System



Building System	Estimated Cost	Percentage of Total Cost
C30 Interior Finishes	\$19,136	100.0%
<b>Total</b>	<b>\$19,136</b>	<b>100%</b>



## Energy Conservation Measures

Energy Conservation opportunities have been identified through an assessment of the systems and equipment during the Facility Condition Assessment (FCA) and provide simple payback in years and the annual cost avoidance for each ECM.

The physical assessment consisted of a limited, non-intrusive visual assessment of the building and its components. It was expected that generally all aspects of the buildings were made assessable, including provision to gain access to the roof, interior areas, mechanical, electrical rooms and common areas. Confined spaces or hazardous areas were not expected to be assessed. Low-sloped roofs with safe access were accessed; however, high-sloped, inaccessible roofs or roofs that were considered unsafe without the use of personal protective equipment were not accessed.

The assessment techniques followed the ASTM standards for property condition assessments (ASTM E2018-15) and consisted of a visual assessment of those components that are readily accessible and visible. The building assessment was limited to those components that affected energy usage, which typically include:

- Building Envelope, material description, construction type, windows and doors
- Lighting, type and approximate coverage by type
- Heating, type and area serviced
- Cooling, type and area serviced
- Ventilation, type
- Domestic Hot Water, method of heating, capacity, storage
- Miscellaneous Equipment, motors, solar panels, pools etc.

We have focused our assessment of energy conservation opportunities on measures that have realistic payback periods of 10 years or less. Our experience tells us that major architectural and mechanical system upgrades are almost never justified based on energy savings alone. We recommend specifying suitable high efficiency replacements for systems that are at the end of their useful life in an effort to lower long term cost of ownership. Some typical examples of energy conservation opportunities that are justified based on energy savings alone include, but are not limited to the following:

- Lighting lamp and ballast retrofits
- Variable Frequency Drive (VFD) upgrades on motors with variable loads greater than 20 horsepower
- HVAC system retrocommissioning and/or controls upgrades
- Instantaneous domestic water heaters
- Heat recovery on 100% fresh air HVAC systems
- Economizer / free cooling upgrades on suitable HVAC systems
- Attic insulation upgrades

## PROJECTED EXPENDITURES

Type	Energy Conservation Measure	Net Cost (\$)	Annual Saving (\$)	Simple Payback (Years)
D5020	ECM 002 Update Interior Lighting to Energy Efficient Lighting	85,661	1,608.92	53.24



## Facility Condition Needs Index

In this report we have calculated the Current Year Facility Condition Needs Index (FCNI) for the facility; illustrating the likely condition of the systems, equipment and building needs should the required funding not be expended over the cost study period. The FCNI is used in Facilities Management to provide a benchmark to compare the relative condition and needs of a group of facilities. The FCNI is primarily used to support asset management initiatives of federal, state, and local government facilities organizations.

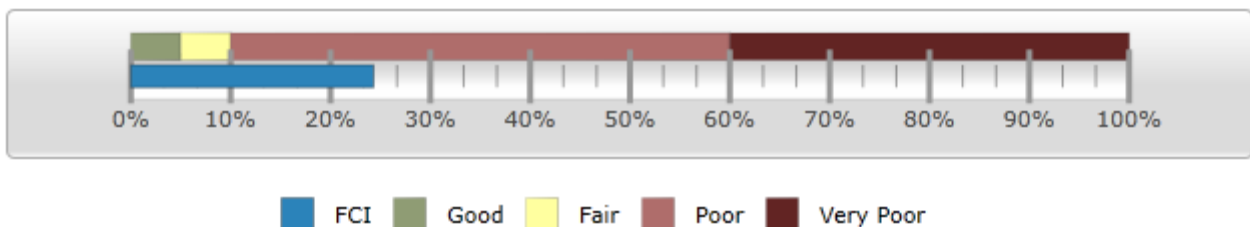
The FCNI is the ratio of accumulated Deferred Maintenance (DM) (total sum of immediate required and recommended works) to the Current Replacement Value (CRV) for a constructed asset. Calculated by dividing DM and Needs by CRV. The range is from zero for a newly-constructed building, to 100% for a constructed asset with a Deferred Maintenance value equal to its CRV. Acceptable ranges vary by Building Type, but as a general guideline, the FCNI scoring system is as follows:

$$\text{FCNI} = \frac{\text{Deferred Maintenance, Immediate Repair Needs and Replacement Deficiencies}}{\text{Current Replacement Value of the Facility(s) (CRV)}}$$

If the FCNI rating is 60% or greater then replacement of the asset/building should be considered instead of renewal.

Condition	Definition	Percentage Value
<b>GOOD</b>	In a new or well-maintained condition with no visual evidence of wear, soiling or other deficiencies.	0% to 5%
<b>FAIR</b>	Subject to wear and soiling but is still in a serviceable and functioning condition.	5% to 10%
<b>POOR</b>	Subjected to hard or long-term wear. Nearing the end of its useful or serviceable life.	Greater than 10%
<b>V-POOR</b>	Subjected to hard or long-term wear. Has reached the end of its useful or serviceable life. Renewal now necessary.	Greater than 60%

The chart below indicates the current FCNI ratio of the Fire Station 9 building.

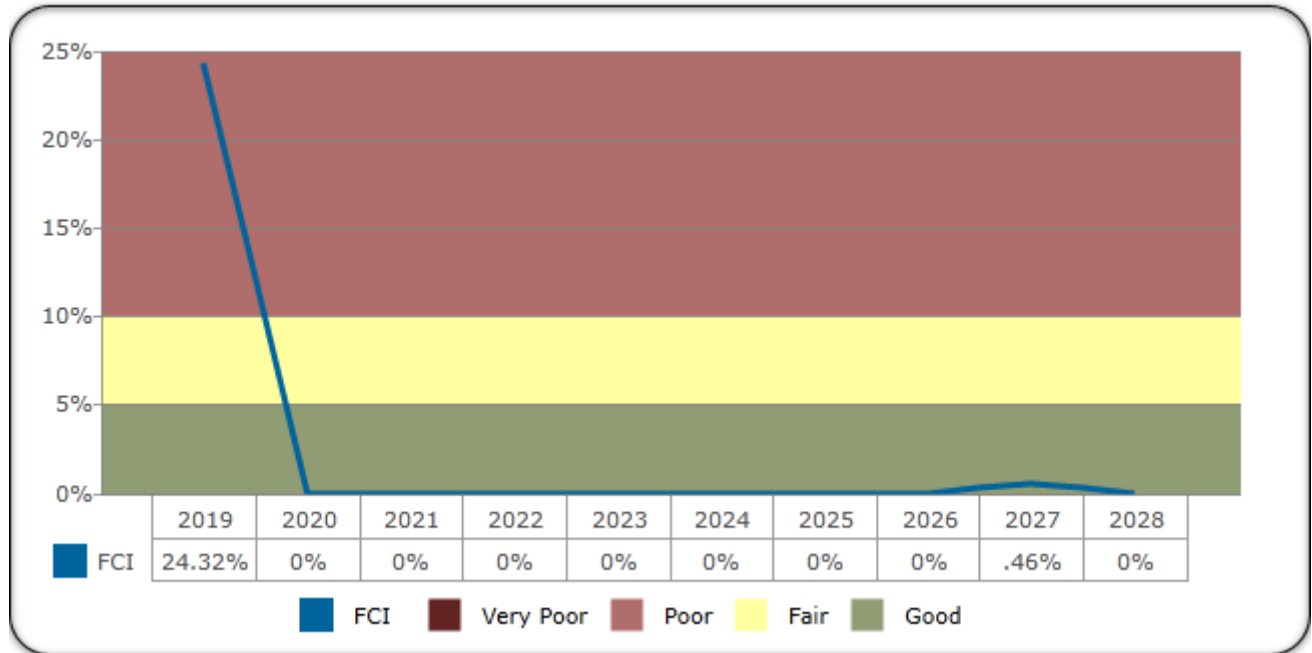


**Fire Station 9, FCNI: 24.32%**



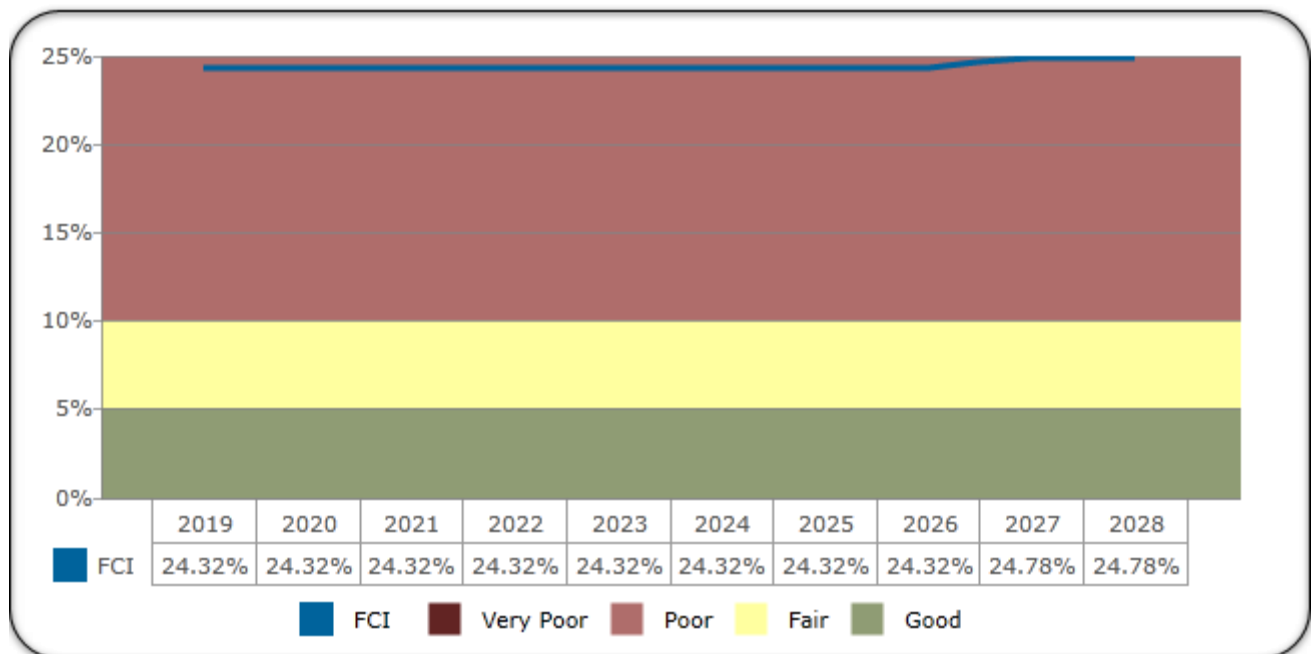
The chart below indicates the effects of the FCI ratio per year, assuming the required funds and expenditures ARE made to address the identified actions each year.

### Year by Year Effects of FCI Over the Study Period



The Chart below indicates the cumulative effects of the FCI ratio over the study period assuming the required funds and expenditures are NOT provided to address the identified works and deferred maintenance each year.

### Cumulative Effects of FCI over the Study Period





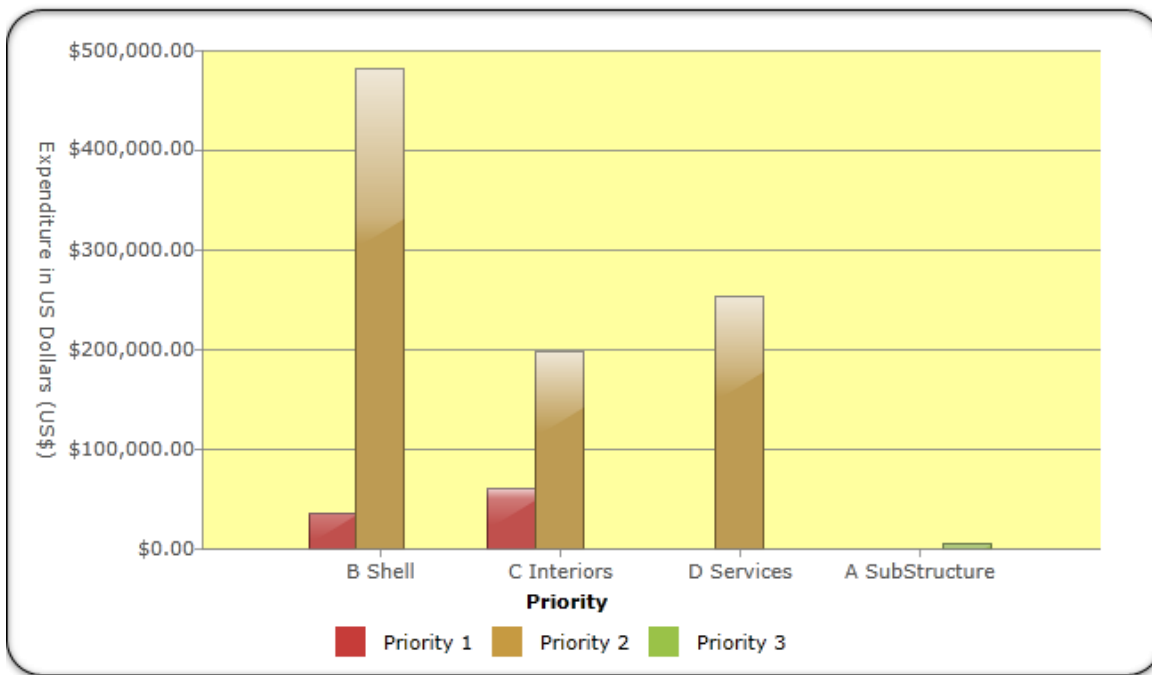
## Needs Sorted by Prioritization of Work

Faithful+Gould has prioritized the identified work in order to assist with analyzing the deficiencies found during the assessment. The following Priorities are shown below:

<b>Priority 1</b> <b>Currently Critical</b>	<ul style="list-style-type: none"> <li>• Systems requiring immediate action that have failed, compromises staff or public safety or requires to be upgraded to comply with current codes and accessibility</li> </ul>
<b>Priority 2</b> <b>Potentially Critical:</b>	<ul style="list-style-type: none"> <li>• A system or component is nearing end of useful life, if not addressed will cause additional deterioration and added repair costs</li> </ul>
<b>Priority 3</b> <b>Necessary / Not Critical:</b>	<ul style="list-style-type: none"> <li>• Lifecycle replacements necessary but not critical or mid-term future replacements to maintain the integrity of the facility or component</li> </ul>

The chart below illustrates the breakdown of expenditure according the priority coding providing an opportunity to strategically plan and effectively direct funding to the highest priority.

**Planning Horizon Needs by System and Priority**



Building System	Priority 1	Priority 2	Priority 3	Total
A SubStructure	\$	\$	\$5,000	\$5,000
B Shell	\$35,000	\$480,586	\$	\$515,586
C Interiors	\$60,000	\$197,022	\$	\$257,022
D Services	\$	\$253,485	\$	\$253,485
<b>Totals</b>	<b>\$95,000</b>	<b>\$931,093</b>	<b>\$5,000</b>	<b>\$1,031,093</b>





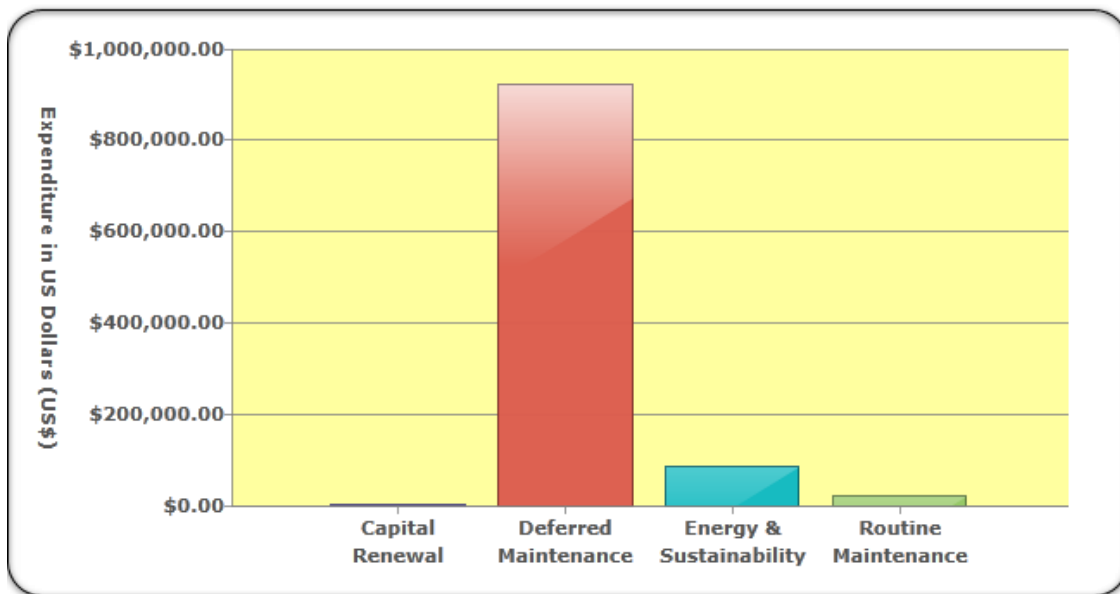
## Needs Sorted by Plan Type

Faithful+Gould has prioritized the identified work according to the Plan Type or deficiency categories in order to assist with analyzing the deficiencies found during the assessment. The following Plan Types are shown below:

<b>Deferred Maintenance</b>	• Maintenance that was not performed when it was scheduled or assets that are past useful life resulting in immediate repair or replacement
<b>Routine Maintenance</b>	• Maintenance that is planned and performed on a routine basis to maintain and preserve the condition
<b>Capital Renewal</b>	• Planned future replacement of building systems that have or will reach the end of their useful life during the study period
<b>Energy &amp; Sustainability</b>	• When the repair or replacement of equipment or systems are recommended to improve energy and sustainability performance
<b>ADA</b>	Repairs, Modifications, or Replacements identified to bring the building or asset in to ADA code compliance

The chart below illustrates the breakdown of expenditure according to the Plan Type or deficiency categories providing an opportunity to strategically plan and effectively direct funding.

**Planning Horizon Needs by Category**



Building System	Total Cost
Deferred Maintenance	\$922,044
Capital Renewal	\$2,375
Routine Maintenance	\$21,013
Energy & Sustainability	\$85,661
<b>Total</b>	<b>\$1,031,093</b>



# ^ SUBSTRUCTURE SYSTEMS

## A10 FOUNDATIONS

### A1031 Standard Slab on Grade

#### DESCRIPTION

The ground floor is comprised of a cast-in-place concrete slab-on-grade bearing on free draining engineered fill material. The compressive strength of the concrete is unknown.

#### CONDITION

The slab-on-grade was observed to be in fair condition. The majority of the slab was visible and there were no signs of undue settling or major cracks noted. Based on the age of the slab, we recommend a structural engineer determine the strength of the slab.

#### PROJECTED EXPENDITURES

Identified recommended works that are required during the 10-year study period are scheduled below.

ID	Type	Recommendation	Priority	Year	Expenditures
296845	A1030	Structural Engineer	Priority 3	2019	\$5,000

#### TOTALS BY YEAR

Year	Total Expenditures
2019	\$5,000



# B SHELL SYSTEMS

## B10 SUPERSTRUCTURE

### B1022 Pitched Roof Construction

#### DESCRIPTION

The roof level is comprised of low sloped and pitched roofs which is constructed of wood beams and trusses with plywood decking.

#### CONDITION

The wood rafters and wood deck were observed to be in fair condition and it is assumed to be original to the structure of the building. Based on the EUL of seventy five years, we recommend replacement early in the study period.

#### PROJECTED EXPENDITURES

Identified recommended works that are required during the 10-year study period are scheduled below.

ID	Type	Recommendation	Priority	Year	Expenditures
296846	B1020	Replace Traditional Wood Beams and Rafters	Priority 2	2019	\$257,920

#### TOTALS BY YEAR

Year	Total Expenditures
2019	\$257,920



## B20 EXTERIOR ENCLOSURE

### B2011 Exterior Wall Construction

#### DESCRIPTION

The building's exterior walls are constructed with wood stud wall construction with a painted stucco exterior finish.

#### CONDITION

The exterior walls were observed to be in fair condition. Some cracking was observed at the time of the assessment. We recommend the walls be repaired and repainted early in the study period.

### B2021 Windows

#### DESCRIPTION

The building contained double glazed fixed aluminum window units. Sealant is provided at the perimeter of the window framing systems.

#### CONDITION

The aluminum windows appeared to be in fair condition. The caulking and sills at the perimeter of the window units appeared to be in poor to fair condition. Due to general drying out as a result of weathering the caulking is starting to deteriorate, we recommend replacement early in the study period. An action has been created.

### B2032 Solid Exterior Doors

#### DESCRIPTION

The building contains single core wood doors and electric overhead roll-up doors on the east elevation of the structure.

#### CONDITION

The wood core doors appeared to be in in poor to fair condition. The single core wood doors had signs of deterioration. Based on the age of the doors and condition, we recommend replacement early in the study period. The roll-up doors were observed to be in fair condition. No issues were reported at the time of the assessment. We assume the doors have surpassed their EUL of thirty years. We recommend replacement early in the study period.



## PROJECTED EXPENDITURES

Identified recommended works that are required during the 10-year study period are scheduled below.

ID	Type	Recommendation	Priority	Year	Expenditures
296847	B2010	Repaint Exterior Wall Surfaces	Priority 2	2019	\$9,243
296848	B2020	Perimeter Caulking to Windows and Replace Window Cills	Priority 1	2019	\$35,000
296849	B2030	Replace Rolling Overhead Doors, Electric	Priority 2	2019	\$27,649
296850	B2030	Replace Single Solid Core Wood Doors	Priority 2	2019	\$13,825

## TOTALS BY YEAR

Year	Total Expenditures
2019	\$85,718





## B30 ROOFING

### B3011 Roof Finishes

#### DESCRIPTION

The roof level is comprised of low sloped and pitched roofs which is constructed of wood beams and trusses with plywood decking. The pitched roof is covered with asphalt shingles and the low sloped section of the roof has BUR roof covering. Galvanized steel gutters and downspouts are present at the roof level and the building exterior walls.

#### CONDITION

The roof covering and galvanized flashing appeared to be in fair condition. No signs of leaks were reported at the time of the assessment. Based on the age of the wood rafters and plywood decking, we recommend replacement of the rafters early in the study period as well as roof coverings.

### B3021 Glazed Roof Openings

#### DESCRIPTION

The building contained metal framed fiberglass sloped skylights which provide natural daylight to the areas of the building that they serve.

#### CONDITION

The skylights appeared to be in fair condition. The typical EUL for this material is thirty years; therefore, we do not recommend replacement during the study period.

#### PROJECTED EXPENDITURES

Identified recommended works that are required during the 10-year study period are scheduled below.

ID	Type	Recommendation	Priority	Year	Expenditures
296851	B3010	Replace Asphalt Shingle Roof	Priority 2	2019	\$152,555
296852	B3010	Replace Galvanized Steel Perimeter Gutters & Downspout	Priority 2	2019	\$2,375
296853	B3010	Replace BUR (Built-up Roofing) Covering	Priority 2	2019	\$17,018

#### TOTALS BY YEAR

Year	Total Expenditures
2019	\$171,948



# C INTERIORS SYSTEMS

## C10 INTERIOR CONSTRUCTION

### C1011 Fixed Partitions

#### DESCRIPTION

Interior fixed partitions are comprised of painted Gypsum Wall Board (GWB) mechanically fixed to wood studs.

#### CONDITION

The interior wall partition all appeared to be in poor to fair condition. There was an environmental issue found inside the gypsum wallboard. Based on the condition and issues found, we recommend replacement and an environmental abatement done early in the study period.

### C1014 Site Built Toilet Partitions

#### DESCRIPTION

The building contains wood floor and wall mounted fixed partition cubicles within the restrooms.

#### CONDITION

The fabricated cubicles appeared to be in poor condition. Based on the condition of the cubicles, we recommend replacement early in the study period.

### C1021 Interior Doors

#### DESCRIPTION

The buildings interior doors consist of several single wood and one full glass wood framed door. The doors have a painted finish.

#### CONDITION

The doors were observed to be in fair condition. No replacement will be required during the study period. We created an action for repainting the doors early in study period.



## PROJECTED EXPENDITURES

Identified recommended works that are required during the 10-year study period are scheduled below.

ID	Type	Recommendation	Priority	Year	Expenditures
296854	C1010	Replace Gypsum Wall Board Stud Walls	Priority 2	2019	\$95,857
296855	C1010	Environmental Abatement	Priority 1	2019	\$60,000
296856	C1010	Replace Toilet Partition	Priority 2	2019	\$7,681
296857	C1020	Paint Interior Doors	Priority 2	2019	\$1,067

## TOTALS BY YEAR

Year	Total Expenditures
2019	\$164,605



## C20 STAIRS

### C2011 Regular Stairs

#### DESCRIPTION

The building contains a single stair case located at the building's east interior elevation. The stairs are constructed of wood and are covered with carpet.

#### CONDITION

The wood stairs were observed to be in poor to fair condition and appeared to be original to the structure. Based on stairs having surpassed the EUL of fifty years, we recommend replacement early in the study period.

#### PROJECTED EXPENDITURES

Identified recommended works that are required during the 10-year study period are scheduled below.

ID	Type	Recommendation	Priority	Year	Expenditures
296858	C2010	Replace Regular Stairs - Wood Construction	Priority 2	2019	\$23,701

#### TOTALS BY YEAR

Year	Total Expenditures
2019	\$23,701



## C30 INTERIOR FINISHES

### C3012 Wall Finishes to Interior Walls

#### DESCRIPTION

Wall finishes include painted gypsum wall board throughout the building.

#### CONDITION

Based on industry standard repainting of the GWB is required every eight years; therefore, repainting of the GWB walls is recommended early in the study period.

### C3021 Floor Toppings

#### DESCRIPTION

The building contains vinyl sheet tiles located in the bathrooms, rubber sheet, broadloom carpet, and refinished concrete.

#### CONDITION

The flooring was observed to be in poor and poor to fair condition. The carpet, vinyl sheet and rubber flooring have surpassed their EUL and we recommend replacement early in the study period. The refinished concrete was observed to be in fair condition and will last beyond the study period.

### C3031 Ceiling Finishes

#### DESCRIPTION

Ceiling finishes feature gypsum wall board with a painted finish.

#### CONDITION

The ceiling finishes were observed to be in fair to good condition. An action has been created for the ceiling to be repainted early in the study period.





## PROJECTED EXPENDITURES

Identified recommended works that are required during the 10-year study period are scheduled below.

ID	Type	Recommendation	Priority	Year	Expenditures
296859	C3010	Replace Painted Finish - Standard	Priority 2	2019	\$19,136
296860	C3010	Replace Painted Finish - Standard	Priority 2	2027	\$19,136
296861	C3020	Replace Broadloom Standard without Padding	Priority 2	2019	\$5,208
296862	C3020	Replace Vinyl Sheet	Priority 2	2019	\$3,780
296863	C3020	Replace Rubber Sheet	Priority 2	2019	\$15,753
296864	C3030	Paint Ceiling	Priority 2	2019	\$5,703

## TOTALS BY YEAR

Year	Total Expenditures
2019	\$49,580
2027	\$19,136



# D SERVICES SYSTEMS

## D20 PLUMBING

### D2011 Water Closets

#### DESCRIPTION

The building contains multiple tank-less type wall mounted vitreous china water closets with plastic seats and manual flush valves located within the restrooms.

#### CONDITION

The water closets appeared to be in fair condition. As a whole the water closets flushed properly and did not have any cracks in the china. Based on the age of the water closets, we recommend replacement early in the study period.

### D2012 Urinals

#### DESCRIPTION

The building contains one wall mounted vitreous china urinal with a manual flush valve located within the restrooms.

#### CONDITION

The urinal appeared to be in poor to fair condition. As a whole the urinal flushed properly and did not have any cracks in the china. Based on the age and condition of the urinal, we recommend replacement early in the study period.

### D2013 Lavatories

#### DESCRIPTION

The building contains three pedestal mounted vitreous china lavatories and one vanity top lavatory located in the restrooms. Single handle faucets and plunge type soap dispensers are present at the lavatories.

#### CONDITION

The lavatories appeared to be in fair condition. As a whole the lavatories drained properly and did not have any cracks in the china. Based on the age of the lavatories, we recommend replacement early in the study period.



## D2014 Sinks

### DESCRIPTION

The building contains one two compartment stainless-steel kitchen sink and one wall mounted service sink.

### CONDITION

The stainless steel sink was operational within no reported issues or damage present and no actions are anticipated during the study period. The custodial sink was observed to be in poor condition. Based on the condition of the custodial sink, we recommend replacement early in the study period.

## D2017 Showers

### DESCRIPTION

The building contains two ceramic tile shower stalls and on fiberglass three wall shower. Standard shower heads and handles are present in the showers.

### CONDITION

The showers were observed to be in poor to fair condition and have surpassed their EUL. Based on their condition, we recommend replacing the showers early in the study period.

## D2021 Cold Water Service

### DESCRIPTION

The domestic cold water system is supplied directly from the local public utility company and we assume enters the building at the south elevation.

### CONDITION

The domestic water system at the building appeared to be in fair condition. No known corrosion was observed at the time of the assessment. Based on the age of the facility, we recommend replacement early in the study period..

## D2022 Hot Water Service

### DESCRIPTION

Domestic hot water is provided by one A.O Smith 100 gallon natural gas hot water heater located in the closet on the south elevation of the station.



## CONDITION

The water heater was observed to be in fair to good condition. The water heater was replaced in 2018. Based on the EUL of fifteen years, no replacement will be required during the study period.

### D2031 Waste Piping

## DESCRIPTION

Waste piping is assumed to be cast iron piping throughout the building.

## CONDITION

The waste system has surpassed the EUL of fifty years. Based on the age of the facility, we recommend replacement early in the study period..

### D2099 Other Piping Systems

## DESCRIPTION

The station contains one air compressor located in a closet on the south elevation of the station.

## CONDITION

The air compressor was observed to be in poor to fair condition. No issues were reported at the time of the assessment. Based on the condition and having surpassed the EUL of twenty five years, we recommend replacement early in the study period.



## PROJECTED EXPENDITURES

Identified recommended works that are required during the 10-year study period are scheduled below.

ID	Type	Recommendation	Priority	Year	Expenditures
296865	D2010	Replace Floor Mounted Water Closets	Priority 2	2019	\$13,230
296866	D2010	Replace Shower - Three Wall Ceramic Tile	Priority 2	2019	\$8,641
296867	D2010	Replace Pedestal Mounted Lavatories	Priority 2	2019	\$6,248
296868	D2010	Replace Vanity Top Lavatories	Priority 2	2019	\$2,756
296869	D2010	Replace Wall Hung Urinals	Priority 2	2019	\$4,743
296870	D2010	Replace Service Sink Wall Mounted	Priority 2	2019	\$6,615
296871	D2010	Replace Shower - Three Wall Fiberglass	Priority 2	2019	\$6,087
296872	D2020	Replace Cold Water Distribution	Priority 2	2019	\$67,109
296873	D2030	Replace Sanitary Water Gravity Discharge	Priority 2	2019	\$28,777
296874	D2090	Replace Air Compressor	Priority 2	2019	\$19,202

## TOTALS BY YEAR

Year	Total Expenditures
2019	\$163,407





## D30 HVAC

### D3032 Direct Expansion Systems

#### DESCRIPTION

Heating and cooling is provided by two full split HVAC systems. The HVAC units are manufactured by Ruud and Samsung. Cooling capacity of the units range from 2-5 tons. The engine bay contains one suspended gas fired heater.

#### CONDITION

The HVAC equipment was observed to be in fair to good condition and has been upgraded within the past two years. No actions or replacement will be necessary during the study period. The suspended heater was observed to be in poor to fair condition. We recommend replacement early in the study period.

#### PROJECTED EXPENDITURES

Identified recommended works that are required during the 10-year study period are scheduled below.

ID	Type	Recommendation	Priority	Year	Expenditures
296875	D3050	Replace Unit Heater - Gas Fired Suspended - 20 MBH	Priority 2	2019	\$4,416

#### TOTALS BY YEAR

Year	Total Expenditures
2019	\$4,416



## D50 ELECTRICAL SYSTEMS

### D5012 Low Tension Service & Dist

#### DESCRIPTION

Electric power is provided via two 120/208-volt, 250-amp panelboard located on the south elevation of the station.

#### CONDITION

The panelboard appeared to be in fair to good condition. Based on the RUL of twelve years, no replacement or actions will be needed during the study period.

### D5022 Lighting Equipment

#### DESCRIPTION

The building's lighting consists of fluorescent light fixtures and exterior wall packs on the exterior walls of the building.

#### CONDITION

The lighting was observed to be in fair condition. There were no issues reported at the time of the assessment. Based on the EUL of twenty years, we recommend upgrading the lighting early in the study period.

## PROJECTED EXPENDITURES

Identified recommended works that are required during the 10-year study period are scheduled below.

ID	Type	Recommendation	Priority	Year	Expenditures
296876	D5020	ECM 002 Update Interior Lighting to Energy Efficient Lighting	Priority 2	2019	\$85,661

## TOTALS BY YEAR

Year	Total Expenditures
2019	\$85,661



# E EQUIPMENT & FURNISHING SYSTEMS

## E20 FURNISHINGS

### E2012 Fixed Casework

#### DESCRIPTION

The building contained wood constructed fixed casework located in the break room. The wood cabinets generally consisted of hardwood frames and plywood plastic laminated finished panels and solid worktops.

#### CONDITION

The fixed casework appeared to be in fair condition. The case work appeared to have been upgraded within the past few years. Based on the condition, no replacement will be required during the study period.



# G BUILDING SITEWORK SYSTEMS

## G20 SITE IMPROVEMENTS

### G2041 Fences & Gates

#### DESCRIPTION

The station contains one set of wrought iron gates located on the east elevation of the station.

#### CONDITION

The wrought iron fence was observed to be in fair to good condition. No replacement will be required during the study period.

## APPENDICES

Appendix A:	Capital Expenditures
Appendix B:	Photographic Record
Appendix C:	Document review and Warranty Information
Appendix D:	Equipment Tables
Appendix E:	Glossary of Terms





# APPENDIX A

## Capital Expenditures



## Deficiency Report

### Fire Station 9

GSF: 5,548

Year Built: 1938

Renew Year :

Replacement Cost: \$4,161,000

Fiscal Year	\$	ID	CSI	Type Name	Description	Materials				Estimate	\$
						Qty	Units	Cost	Assessed Cost		
2019	\$1,011,957	296845	A1030	Routine Maintenance	Structural Engineer	1	SF	\$5,000.00	\$5,000		\$5,000
		296846	B1020	Deferred Maintenance	Replace Traditional Wood Beams and Rafters	5548	SF	\$46.49	\$257,920		\$257,920
		296847	B2010	Routine Maintenance	Repaint Exterior Wall Surfaces	4240	SF	\$2.18	\$9,243		\$9,243
		296848	B2020	Deferred Maintenance	Perimeter Caulking to Windows and Replace Window Cills	1	EACH	\$35,000.00	\$35,000		\$35,000
		296849	B2030	Deferred Maintenance	Replace Rolling Overhead Doors, Electric	240	SF	\$115.21	\$27,649		\$27,649
		296850	B2030	Deferred Maintenance	Replace Single Solid Core Wood Doors	3	EACH	\$4,608.45	\$13,825		\$13,825
		296851	B3010	Deferred Maintenance	Replace Asphalt Shingle Roof	4843	SF	\$31.50	\$152,555		\$152,555
		296853	B3010	Deferred Maintenance	Replace BUR (Built-up Roofing) Covering	705	SF	\$24.14	\$17,018		\$17,018
		296852	B3010	Capital Renewal	Replace Galvanized Steel Perimeter Gutters & Downspout	82	LF	\$28.97	\$2,375		\$2,375
		296856	C1010	Deferred Maintenance	Replace Toilet Partition	2	EACH	\$3,840.38	\$7,681		\$7,681
		296854	C1010	Deferred Maintenance	Replace Gypsum Wall Board Stud Walls	4161	SF	\$23.04	\$95,857		\$95,857
		296855	C1010	Deferred Maintenance	Environmental Abatement	1	EACH	\$60,000.00	\$60,000		\$60,000
		296857	C1020	Routine Maintenance	Paint Interior Doors	294	SF	\$3.63	\$1,067		\$1,067

## Deficiency Report

Fiscal Year	\$	ID	CSI	Type Name	Description	Materials				Estimate	\$
						Qty	Units	Cost	Assessed Cost		
2019	\$1,011,957	296858	C2010	Deferred Maintenance	Replace Regular Stairs - Wood Construction	1	Flight	\$23,700.60	\$23,701		\$23,701
		296859	C3010	Deferred Maintenance	Replace Painted Finish - Standard	4161	SF	\$4.60	\$19,136		\$19,136
		296861	C3020	Deferred Maintenance	Replace Broadloom Standard without Padding	80	SY	\$65.10	\$5,208		\$5,208
		296862	C3020	Deferred Maintenance	Replace Vinyl Sheet	250	SF	\$15.12	\$3,780		\$3,780
		296863	C3020	Deferred Maintenance	Replace Rubber Sheet	600	SF	\$26.26	\$15,753		\$15,753
		296864	C3030	Routine Maintenance	Paint Ceiling	1571	SF	\$3.63	\$5,703		\$5,703
		296869	D2010	Deferred Maintenance	Replace Wall Hung Urinals	1	EACH	\$4,742.87	\$4,743		\$4,743
		296865	D2010	Deferred Maintenance	Replace Floor Mounted Water Closets	3	EACH	\$4,410.00	\$13,230		\$13,230
		296866	D2010	Deferred Maintenance	Replace Shower - Three Wall Ceramic Tile	2	EACH	\$4,320.41	\$8,641		\$8,641
		296867	D2010	Deferred Maintenance	Replace Pedestal Mounted Lavatories	2	EACH	\$3,123.75	\$6,248		\$6,248
		296868	D2010	Deferred Maintenance	Replace Vanity Top Lavatories	1	EACH	\$2,756.25	\$2,756		\$2,756
		296870	D2010	Deferred Maintenance	Replace Service Sink Wall Mounted	1	EACH	\$6,615.00	\$6,615		\$6,615
		296871	D2010	Deferred Maintenance	Replace Shower - Three Wall Fiberglass	1	EACH	\$6,087.00	\$6,087		\$6,087
		296872	D2020	Deferred Maintenance	Replace Cold Water Distribution	5548	SF	\$12.10	\$67,109		\$67,109
		296873	D2030	Deferred Maintenance	Replace Sanitary Water Gravity Discharge	5548	SF	\$5.19	\$28,777		\$28,777
		296874	D2090	Deferred Maintenance	Replace Air Compressor	1	EACH	\$19,201.88	\$19,202		\$19,202
		296875	D3050	Deferred Maintenance	Replace Unit Heater - Gas Fired Suspended - 20 MBH	1	EACH	\$4,416.43	\$4,416		\$4,416
		296876	D5020	Energy & Sustainability	ECM 002 Update Interior Lighting to Energy Efficient Lighting	5548	SF	\$15.44	\$85,661		\$85,661

Deficiency Report

						Materials					
Fiscal Year	\$	ID	CSI	Type Name	Description	Qty	Units	Cost	Assessed Cost	Estimate	\$
2027	\$19,136	296860	C3010	Deferred Maintenance	Replace Painted Finish - Standard	4161	SF	\$4.60	\$19,136		\$19,136
Total										Total:	\$1,031,093

## APPENDIX B

### Photographic Record



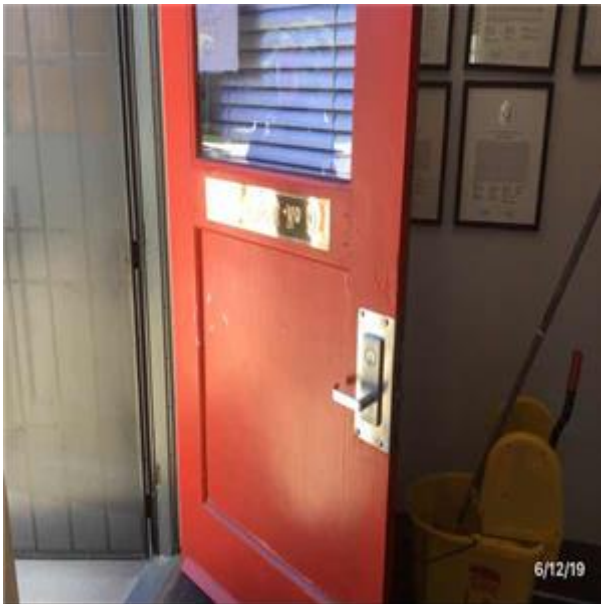




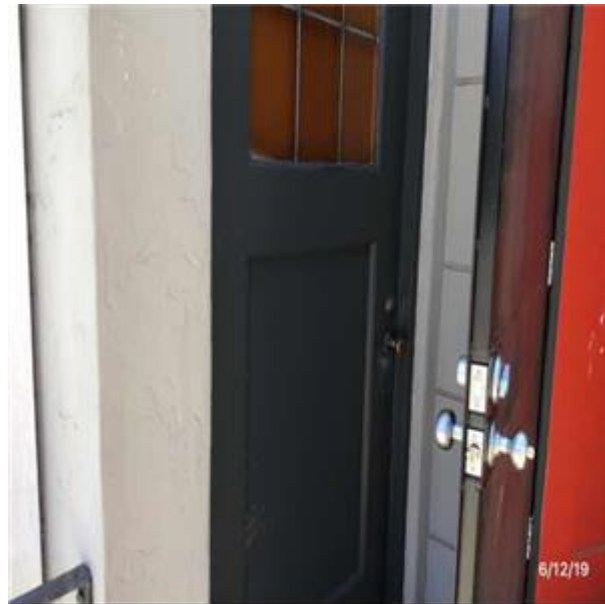
View of Stucco over Stud Walls



B2011 Exterior Wall Construction :-  
View of Stucco over Stud Walls



View of Single Solid Core Wood Doors



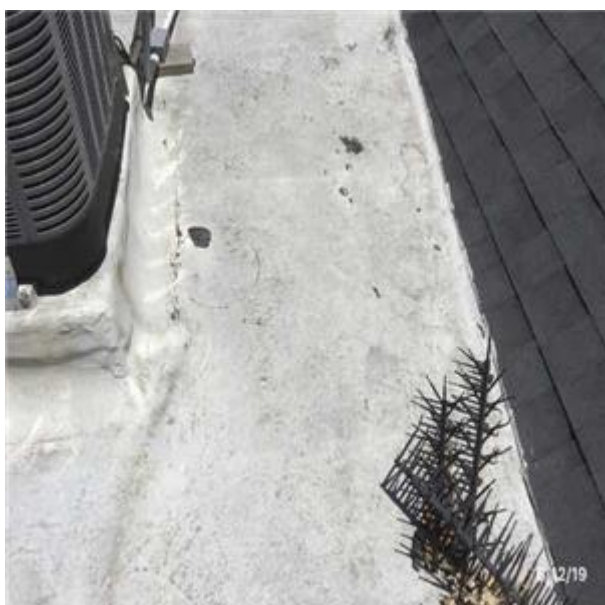
B2032 Solid Exterior Doors :-  
View of Single Solid Core Wood Doors



View of Rolling Overhead Doors, Electric



B3011 Roof Finishes :-  
View of Asphalt Shingle Roof



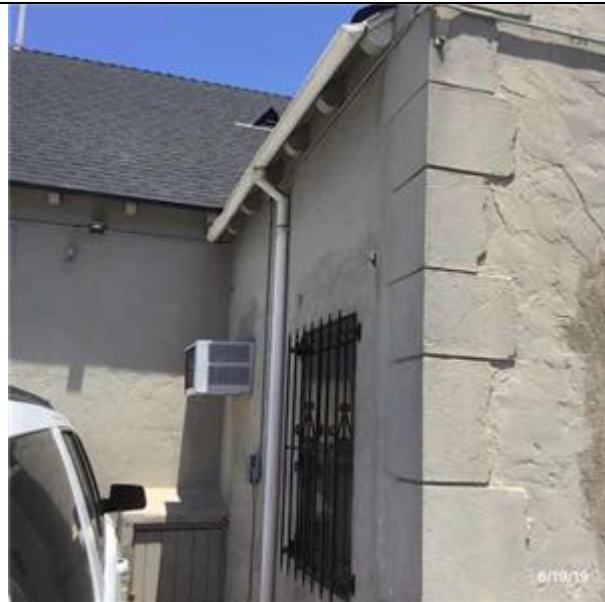
View of BUR (Built-up Roofing) Covering



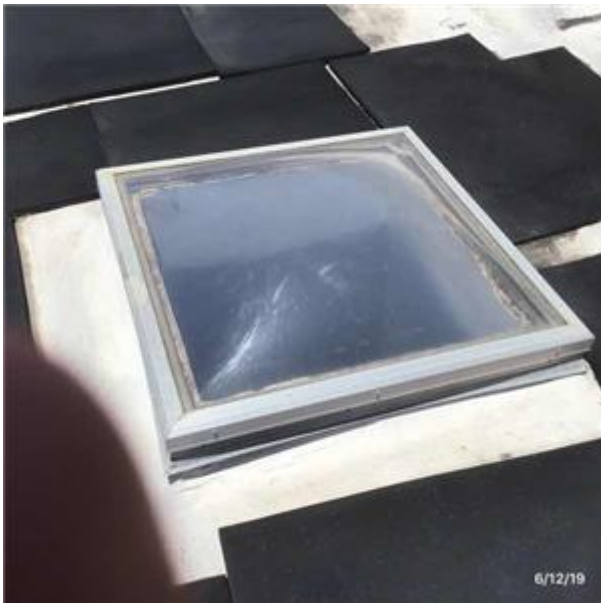
B3011 Roof Finishes :-  
View of Asphalt Shingle Roof



View of BUR (Built-up Roofing) Covering



B3016 Gutters and Downspouts : -  
View of Galvanized Steel Perimeter Gutters &  
Downspout



View of Skylight - Plastic



C1011 Fixed Partitions : -  
View of Gypsum Wall Board Stud Walls

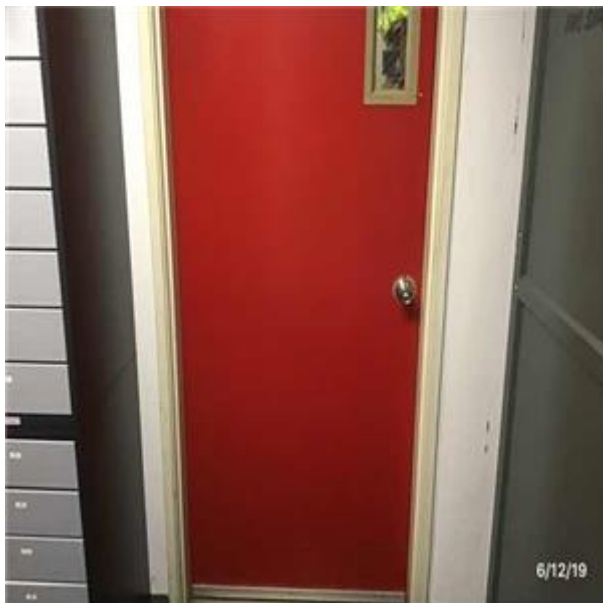




View of Toilet Partition



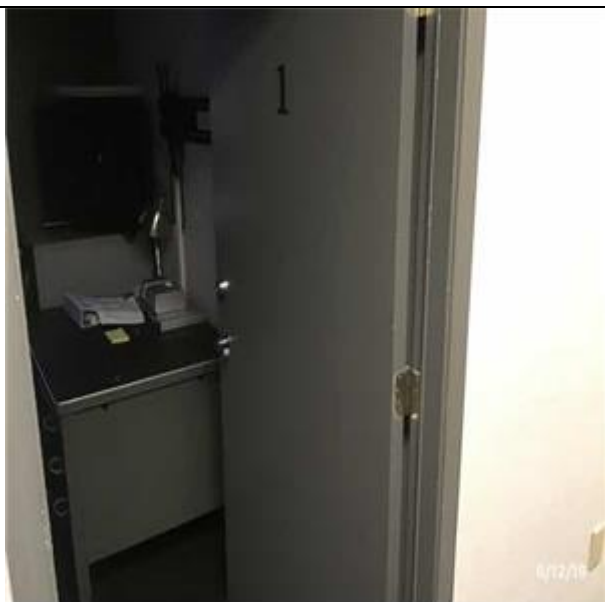
C1021 Interior Doors :-  
View of Interior Single Full Glass Frameless Door(s)



View of Interior Single Wood Door(s)



C1021 Interior Doors :-  
View of Interior Single Wood Door(s)



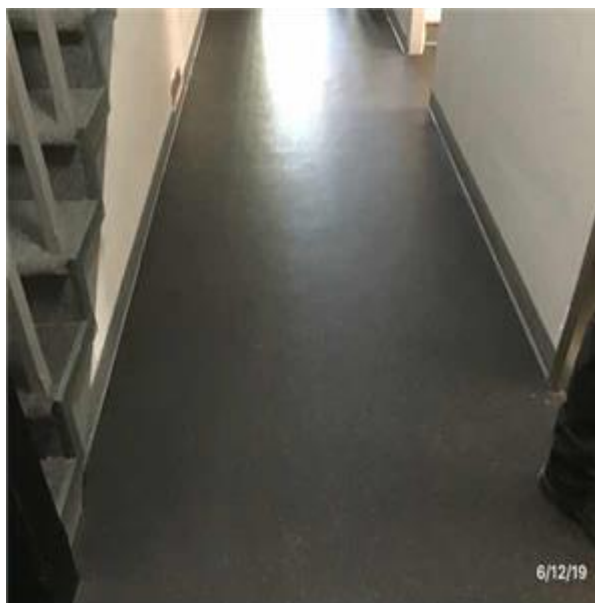
View of Interior Single Wood Door(s)



C2011 Regular Stairs :-  
View of Regular Stairs - Wood Construction



View of Refinish Concrete Floor



C3024 Flooring :-  
View of Rubber Sheet





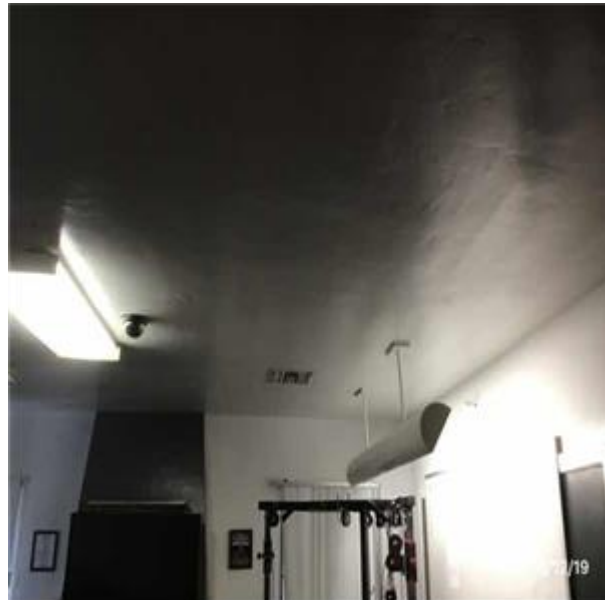
View of Vinyl Sheet



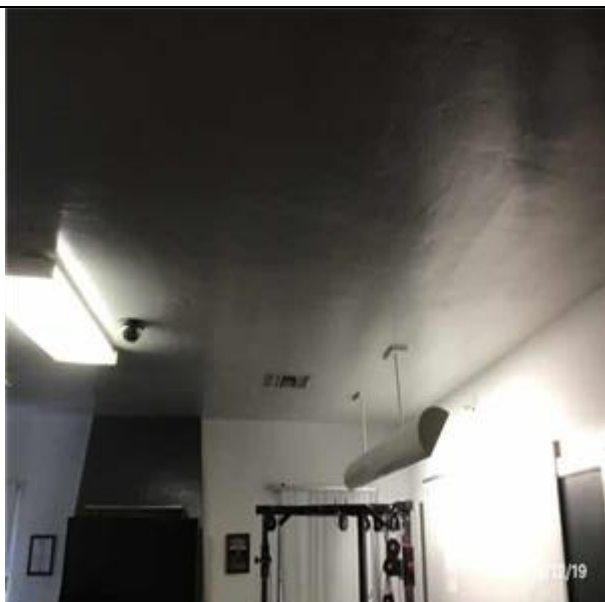
C3025 Carpeting :-  
View of Broadloom Standard without Padding



View of Broadloom Standard without Padding



C3025 Carpeting :-  
View of Broadloom Standard without Padding



View of Gypsum Wall Board Ceilings



D2011 Water Closets :-  
View of Floor Mounted Water Closets



View of Pedestal Mounted Lavatories



D2013 Lavatories :-  
View of Vanity Top Lavatories



View of Service Sink Wall Mounted



D2017 Showers :-  
View of Shower - Three Wall Ceramic Tile



View of Shower - Three Wall Fiberglass



D2017 Showers :-  
View of Shower - Three Wall Ceramic Tile





View of Domestic Hot Water Heater - Gas



D2099 Other Piping Systems :-  
View of Air Compressor



View of Air Compressor



D3032 Direct Expansion Systems :-  
View of Split-System (Full System)



View of Split-System (Full System)



D3051 Terminal Self-Contained Units :-  
View of Unit Heater - Gas Fired Suspended - 20  
MBH

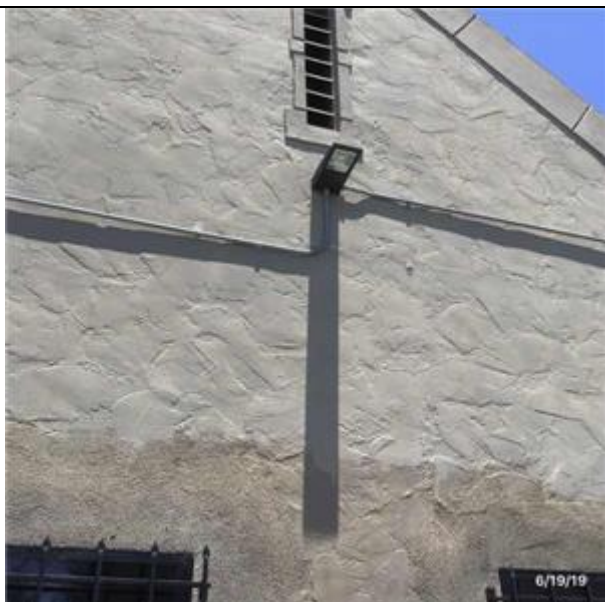


View of Panelboard - 120/240volts, 60 to 2000amp



D5012 Low Tension Service & Dist :-  
View of Panelboard - 120/240volts, 60 to 2000amp

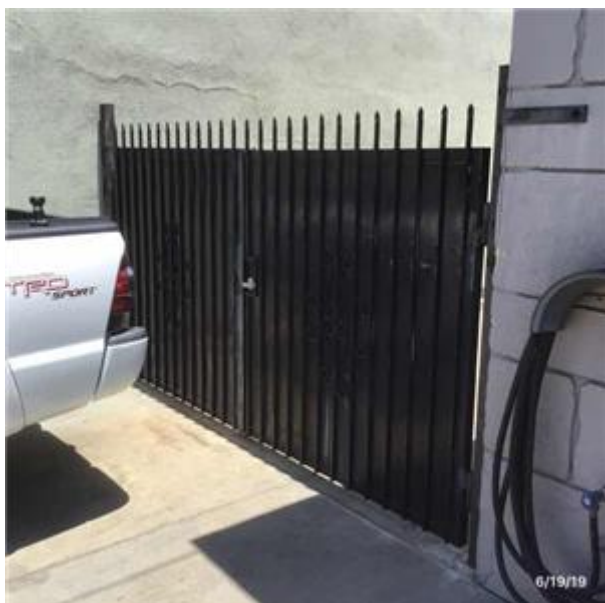




View of Exterior Wall Pack Light Fixtures



D5022 Lighting Equipment :-  
View of Interior Light Fixtures - Fluorescent



View of Wrought Iron


## APPENDIX C

### Document Review and Warranty Information





The following documents were reviewed as part of the facility condition assessment of the Fire Station 9 facility:

 No documents were reviewed as part of the assessment.

## APPENDIX D

### Equipment Tables



**Table D20 Summary of Domestic Water Heating Equipment**

Location	Equipment Type	Manufacturer	Model No.	Serial No.	Tag	Capacity/ Rating	Fuel Type	Year
Exterior								1938
Interior	Domestic Water Heater	A.O.Smith	BT100	MC02 - 15481 45	Unknown	100	Natural Gas	2018

**Table D30 Summary of HVAC Equipment**

Location	Equipment Type	Manufacturer	Model No.	Serial No.	Tag	Capacity/ Rating	Fuel Type	Year
Interior								2000
Roof	Split-System (Full System)	Ruud	RA1460AJ	W301710 116	Unknown	5 Ton	Electric	2017
Roof	Split-System (Full System)	Samsung	AR09JSA L	Unknown	Unknown	2 Ton	Electric	2016



# APPENDIX E

## Glossary of Terms





### Acronyms & Glossary of Terms

ABC	Aggregate Base Course
BUR	Built-Up Roof
CIP	Cast-In-Place
CMU	Concrete Masonry Unit
EIFS	Exterior Insulation and Finish System
EPDM	Ethylene Propylene Diene Monomer
HM	Hollow Metal Doors
MH	Man Holes
SC	Solid Core Doors
TPO	Thermoplastic Polyolefin
AHU	Main Air Handling Units
EF	Exhaust Fan
EMC	Electrical Metallic Conduit
EMT	Electrical Metallic Tubing
FACP	Fire Alarm Control Panel
FCC	Fire Command Center
FCU	Fan Coil Unit
FSS	Fuel Supply System
MDP	Main Distribution Panel
NAC	Notification Appliance Circuit
RTU	Roof Top Unit
SES	Service Entrance Switchboards
VAV	Variable Air Volume
VFD	Variable Frequency Drives
CRV	Current Replacement Value
DM	Deferred Maintenance
EOL	End of Life
EUL	Estimated Useful Life
FCI	Facility Condition Index
HVAC	Heating Ventilating and Air Conditioning
RUL	Recommended Useful Life
AMP	Amperage
BTU/HR	British Thermal Units per Hour
FPM	Feet per Minute (Elevator Speed)
GPF	Gallons Per-Flush
HID	High-Intensity Discharge
HP	Horse Power
KVA	Kilovolt-Ampere
kW	Kilowatt
PSF	Pounds-Per-Square-Foot
PSI	Pounds-Per-Square-Inch
RO	Reverse Osmosis
SF	Square Foot
SY	Square Yards
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association



### Acronyms & Glossary of Terms

**BTU** – British Thermal Unit; the energy required to raise the temperature of one pound of water by one degree.

**Building Envelope** – The enclosure of the building that protects the building's interior from the outside elements, namely the exterior walls, roof, and soffit areas.

**Building Systems** – Interacting of independent components or assemblies, which from single integrated units, that comprise a building and its site work, such as, pavement and flatwork, structural frame, roofing, exterior walls, plumbing, HVAC, electrical, etc.

**Caulking** – Soft, putty-like material used to fill joints, seams, and cracks.

**Codes** – See building codes.

**Component** – A fully functional portion of a building system, piece of equipment, or building element.

**Deferred Maintenance** – Physical deficiencies that cannot be remedied with routine maintenance, normal operating maintenance, etc., excluding de minimis conditions that generally do not present a material physical deficiency to the subject property.

**Expected Useful Life (EUL)** – the average amount of time in years that an item, component of system is estimated to function when installed new and assuming routine maintenance is practiced.

**Facility** – All of any portion of buildings, structures, site improvements, complexes, equipment, roads, walks, passageways, parking lots, or other real or personal property located on site.

**Flashing** – A thin, impervious sheet of material placed in construction to prevent water penetration or to direct the flow of water. Flashing is used especially at roof hips and valleys, roof penetrations, joints between a roof and a vertical wall, and in masonry walls to direct the flow of water and moisture.

**Remaining Useful Life (RUL)** – A subjective estimate based upon observations, or average estimates of similar items, components, or systems, or a combination thereof, of a number of remaining years that an item, component, or system is established to be able to function in accordance with its intended purpose before warranting replacement. Such period of time is affected by the initial quality of an item, component, or system, the quality of the initial installation, the quality and amount of preventative maintenance exercised, climatic conditions, extent of use, etc.

**Structural Frame** – the components or building systems that support the building's non-variable forces or weights (dead loads) and variable forces or weights (live loads).

**Thermal Resistance (R)** – A unit used to measure a material's resistance to heat transfer. The formula for thermal resistance is:  $R = \text{Thickness (in inches)} / K$ .

**Warranty** – Legally enforceable assurance of quality or performance of a product or work, or of the duration of satisfactory performance. Warranty guarantee and guaranty are substantially identical in meaning; nevertheless, confusion frequently arises from supposed distinctions attributed to guarantee (or guaranty) being exclusively indicative of duration of satisfactory performance or of a legally enforceable assurance furnished by a manufacturer or other third party. The uniform commercial code provisions on sales (effective in all states except Louisiana) use warranty but recognize the continuation of the use of guarantee and guaranty.



Claim No	Status	Type	Incident
20180042	Closed	Waste Basket	7/11/2017
20180043	Closed	Waste Basket	7/11/2017
20180044	Closed	Waste Basket	7/11/2017
20180410	Closed	First Aid	8/29/2017
20180617	Closed	First Aid	10/11/2017
20180916	Open	Record Only	4/23/2017
20180935	Open	Record Only	3/1/2000
20180936	Open	Record Only	6/1/2005



## Description

Jon got a rash at station 9 that statred 2 weeks ago, rash has gotten worse and now has a active cough and rash has spread to complete back

Jon got a rash at station 9 that statred 2 weeks ago, rash has gotten worse and now has a active cough and rash has spread to complete back

Jon got a rash at station 9 that statred 2 weeks ago, rash has gotten worse and now has a active cough and rash has spread to complete back

FF LIN CONDUCTED NORMAL WORK ACTIVITIES OVER A 72 HR PERIOD. UPON WAKING FROM SLEEP, HE NOTICED THE MARKED SWELLING AND ITCHING AND REPORTED TO OCCUPATIONAL HEALTH.

FF GRIMES AWOKE IN THE MORNING TO FIND HIS BACK AND LEFT FLANK COVERED IN RAISED, ITCHY HIVES. OTHER PERSONNEL AT STATION 9 HAVE REPORTED SIMILAR SYMPTOMS WITHOUT KNOW CAUSE OR RESOLUTION.

Inhalation of active mold growth while assigned to Fire Station 9 from 1/2/2010 - 4/23/2017.

I was assigned to Station 9 from approx. 2000-2006. Recently mold was discovered all throughout the station.

I was assigned to Station 9 from approx. June 2005 - January 2006. Recently mold was discovered all throughout the station.

*Long Beach Fire Station #9 – Mold Assessment Report and Engineer's Cost Estimate*



June 17, 2020

Mr. Derry MacMahon  
City of Long Beach Public Works  
411 West Ocean Blvd  
Long Beach, California 90802

SUBJECT: Long Beach Fire Station #9 – Mold Assessment Report and Engineer's Cost Estimate  
(FINAL)

Mr. MacMahon:

Tetra Tech, Inc. and its subcontractor SCS Engineers, Inc. is pleased to provide this Letter Report outlining the enclosed Recommendations for Mold Remediation Report and Engineer's Cost Estimate to abate mold and to rehabilitate the City of Long Beach's Fire Station #9 (Site) at 3917 Long Beach Boulevard, Long Beach, CA 90807. Proposed improvements provide for a completely renovated facility and include a new roof and building modifications to expand and update the living quarters on the second floor.

**Task 1 – Mold Remediation Report** - The enclosed report from SCS Engineers includes the following:

- a) Review of provided documents related to mold investigations and conclusions drawn from these documents.
- b) Site visit to observe existing building and property conditions.
- c) Written technical opinion of the items that need to be addressed to return the building to a habitable condition, without water intrusion or internal mold growth.
- d) Recommendations to remediate mold in order to allow the building to be returned to public use.

**Task 2 – Engineer's Building Repair Cost Estimate** - Tetra Tech has taken the recommendations from SCS Engineer's to address the mold issues at the site and added other repair items to return the building to habitable conditions including:

- a) Roof Replacement
- b) 2<sup>nd</sup> Story Building Modifications
- c) Seismic Retrofits including foundation
- d) Elevator (Exterior)
- e) Accessibility Improvements
- f) Civil/Drainage Improvements
- g) Window Replacement
- h) Gutter Replacement
- i) New HVAC system
- j) New plumbing
- k) New Kitchen

- l) New Shower Rooms – Male/Female
- m) Furnishings

Structural and seismic evaluations have not been conducted and cost to address these concerns has only been estimated in this report. It must be understood that the above-mentioned repairs may not be easily implemented given the original construction and lack of space on the property to expand.

California Building Code requirements combined with National Fire Prevention Association (NFPA) standards for fire station design would require very extensive modifications to the existing facility, including the inclusion of gender specific facilities. Modern fire station design for a fire station that serves a high population would eliminate this site from consideration based on the size of the parcel alone.

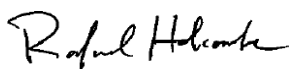
The existing building is over 50 years old and will be considered for historical preservation. Second story modifications will be required to convert the attic space into much needed usable living and working quarters. In order to accommodate this modification, the existing pitched roof feature and wooden beams in the apparatus bay will need to be demolished, to make way for the additional space required. There will also be a need for significant modifications to the stucco to accommodate the proposed roof changes, the replacement of the windows and the repair existing cracks in the stucco. Preservation of remaining building will come at a premium as these will be impediments to construction.

Mold abatement will require the encapsulation of the building frame elements. The encapsulation is required to help resolve the continuing mold problems encountered in this building. All flooring, stucco and wall panels (interior and exterior) will need to be removed in order to achieve full mold abatement.

Parking on the site is extremely limited. As it stands, employee parking poses an obstruction to the function of a fire station. Parking in the immediate neighborhood is considered impacted. Creating surface parking at the site is not possible due to the limited undeveloped area. Parking considerations have not been included in the cost estimate but should be considered in the planning process.

Thank you for the opportunity to propose on this project with the City's Public Works and Fire Department.

Regards,



Rafael. J. Holcombe, P.E.  
Project Manager



Cc: Jeb Douglas, SCS Engineers

May 13, 2020  
File No. 01220107.00

Mr. Rafael Holcombe  
Tetra Tech  
249 East Ocean Boulevard, Suite 325  
Long Beach, CA 90802-4885  
562.257.1589

(via email [Rafael.Holcombe@tetrattech.com](mailto:Rafael.Holcombe@tetrattech.com))

**Subject: Recommendations for Mold Remediation  
City of Long Beach Fire Station Number 9  
3917 Long Beach Avenue, Long Beach, California**

Dear Mr. Holcombe:

SCS Engineers (SCS) presents this report for the Fire Station No. 9 ("Site") located in Long Beach, California. SCS understands that the existing fire station was constructed in 1939, and the building has been occupied until recently. Since approximately 2015, varying episodes of occupant complaints have occurred regarding mold in the building. Various reports prepared by others regarding mold investigation have discussed the presence of conditions indicative of indoor mold growth. It is our understanding that the City of Long Beach desires to remediate the mold affected building materials and renovate the building for future use.

## File Review Results and Interpretation

SCS reviewed historical documents regarding water intrusion issues, indoor air quality investigations, fungal investigations, and quarterly industrial hygiene inspections. Pacific EH&S Services, Inc. (Pacific) reported on a hot water pipe leak in their report dated April 30, 2015. Pacific reported buckled wood floors and elevated moisture in the wood flooring. Since visible mold was not observed, Pacific concluded that sampling was not necessary. On September 5, 2017, Pacific reported on fungal air sampling and concluded "The airborne concentrations and distributions were considered completely normal and indicative of a normal indoor environment." SCS disagrees with Pacific on the interpretation of their results as eight (8) types of mold spores were reported in indoor samples at concentrations equal to or greater than outdoor spore counts. Mold spore numbers in interior samples that exceed exterior samples are typically interpreted as an indicator of mold growth within a structure. This is significant as one of the spore types reported inside the building was identified as *Stachybotrys*, a variety of mold known to produce mycotoxins which can cause human mycotoxicosis. *Stachybotrys* was not identified in the outdoor sample analyzed. Berlin Nelson<sup>1</sup>, a Professor in the Department of Plant Pathology at North Dakota State University, Fargo, Nebraska,

<sup>1</sup> <https://www.apsnet.org/edcenter/apsnetfeatures/Pages/Stachybotrys.aspx>





reports that since approximately 1985 “evidence has accumulated implicating this fungus as a serious problem in homes and buildings and one of the causes of the ‘sick building syndrome.’”

In their report dated December 13, 2017, Health Science Associates (HSA) observed numerous water leaks in the building related to winter storms during 2016-2017. HSA observed visible mold growth in several areas, including the kitchen and exercise room. Additionally, HSA collected surface samples for mold analysis and reported elevated spore counts and mold growth in almost every sample analyzed. HSA also reported visible mold growth inside the wall cavity of Room #3. HSA recommended remedial measures be implemented, including cleaning, building material replacement, and encapsulation.

HSA also performed quarterly industrial hygiene inspections at the Site, detailed in a report dated February 22, 2019. HSA reported visible water leakage on both floors as part of an inspection conducted during a rainstorm. Furthermore, HSA observed water beneath the building as well as clogged roof drains. HSA concluded that additional unspecified cleaning and repairs were needed. HSA also reported that mold remediation had been performed in the past, but did not provide the date of remediation.

## Site inspection

SCS visited the Site on March 9, 2020 to perform a visible non-destructive inspection of the interior and exterior of the building. The weather at the time of the inspection was dry and sunny, and the building was unoccupied. The building is reportedly no longer used as a fire station due in part to the long history of occupant illness, supposedly due to mold, and that the garages are too small to accommodate modern fire fighting vehicles. SCS did not observe visible mold, however, there was evidence of water intrusion, consisting of blistered and flaking paint, water staining, and dry rot (caused by mold). SCS observed numerous penetrations through the exterior walls (for utilities, signs, vents, drains, etc.) that were not sealed properly, as well as missing roof drain pipes, clogged roof drains, and evidence of ponding water along the perimeter of the building. No gravel drains or drainage culverts were present along the base of the exterior of the building.

## Conclusions and Recommendations

Based on multiple reported water leaks into the building, the historical reports of mold present in the building, and SCS’ interpretation that mold growth was likely occurring in the building when other consultants reported it was not, SCS concludes that major renovation/restoration of the building is necessary. If significant mold growth is observed during building renovation, a licensed mold remediation company should be contracted to remove and dispose of the mold-impacted building materials. Additionally, a licensed mold remediation contractor should be utilized to encapsulate portions of the building materials that cannot be removed during renovation, such as the inside of the exterior walls and wooden framing.

In order to protect the health and safety of building personnel and the public, if the building is returned to public use, SCS recommends the procedures listed below be implemented during building restoration activities. The following recommended building improvements do not include an assessment of civil/structural/accessibility upgrades which may be required to return this facility to public use and/or active use as a fire station.

Recommended Building Improvements

- Remove the existing roofing materials
- Repair/replace the wood underlayment for the roof wherever dry rot or damage is present
- Repair/replace roof drains and overflow drains and associated piping
- Install a new roof
- Remove exterior wall penetrations that are no longer necessary or functional
- Remove/replace windows and associated framing throughout the building
- Install drainage structures around the exterior perimeter of the building, such as culverts or French drains
- Remove/redesign/replace existing ground level vents providing air beneath the floor, to avoid stormwater intrusion beneath the building
- Remove wallboard and internal insulation throughout the interior of the building
- Seal each exterior wall penetration on both the interior and exterior of the penetrations
- Replace wood framing where damaged or where visible mold growth is present
- Encapsulate remaining exposed wood framing and the inside of the exterior walls
- Replace insulation and interior walls
- Remove flooring throughout the interior of the building
- Repair/replace subfloor and joists where damaged
- Remove floor penetrations if no longer necessary or non-functional
- Replace floor
- Seal floor penetrations both above and below the floor

## LIMITATIONS

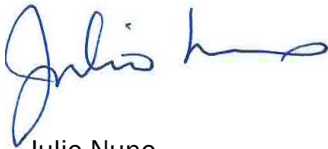
This report has been prepared to assist Tetra Tech and the City of Long Beach in evaluating the option to renovate and reuse the existing Fire Station No. 9. The objective of this assessment was to perform the work with care, exercising the customary skill and competence of consulting professionals in the relevant disciplines in this region. The conclusions presented in this report are professional opinions based solely upon reports prepared by others and our visual non-destructive inspection of the building. The opinions presented herein apply to site conditions existing at the time of our investigation and those reasonably foreseeable.

No express or implied representation or warranty is included or intended in our report except that our work was performed, within the limits prescribed by our client, with the customary thoroughness and competence of our profession at the time and place the services were rendered.

This report was prepared for the use of Tetra Tech, and their client, the City of Long Beach. The contents of the report shall not be used or relied upon in any way by others without prior written approval of SCS.

SCS thanks you for the opportunity to assist in completing this assessment. SCS is available to further discuss our conclusions and recommendations. If you have questions, please don't hesitate to contact us at 562-426-9544.

Sincerely,



Julio Nuno  
Senior Vice President  
SCS Engineers



Jed Douglas, CIH, CSP  
Senior Project Advisor  
SCS Engineers

FIRE STATION 9 - COST ESTIMATE					
	Item	Estimated Qty.	Unit	Unit Price	Item Total
<b>1</b>	<b>Demolition</b>				
1.1	Tools & Equipment	1	LS	\$15,000.00	\$15,000.00
1.2	Remove Flooring	3000	SF	\$4.00	\$12,000.00
1.3	Remove Ceiling	3000	SF	\$3.00	\$9,000.00
1.4	Remove Interior Walls	24000	SF	\$2.00	\$48,000.00
1.5	Protect Exterior Walls	36000	SF	\$1.00	\$36,000.00
1.6	Roof	3500	SF	\$4.00	\$14,000.00
1.7	Dumpsters	8	EA	\$250.00	\$2,000.00
1.8	Disposal fees	1	LS	\$8,500.00	\$8,500.00
1.9	Supervision	240	HR	\$95.00	\$22,800.00
<b>2</b>	<b>Abatement</b>				
2.1	Set-up, Encapsulation	1	LS	\$40,000.00	\$40,000.00
2.2	Removal of Gypsum Board	580	SF	\$65.00	\$37,700.00
2.3	Dumpsters	8	EA	\$2,000.00	\$16,000.00
2.4	Abatement	1	LS	\$175,000.00	\$175,000.00
2.5	Hepa Scrubbers	10	EA	\$200.00	\$2,000.00
2.6	Bagging	160	EA	\$75.00	\$12,000.00
2.7	Transport/Disposal to Approved Facility	1	LS	\$65,000.00	\$65,000.00
<b>3</b>	<b>Civil/Drainage Improvements</b>				
3.1	Grading	1	LS	\$6,000.00	\$6,000.00
3.2	Paving/Stripping	1	LS	\$28,000.00	\$28,000.00
3.3	Drainage Improvements	1	LS	\$45,000.00	\$45,000.00
<b>4</b>	<b>Access Improvements</b>				
4.1	Staircase and Landings (Code)	1	LS	\$22,000.00	\$22,000.00
4.2	Attic Access Improvements	1	LS	\$7,500.00	\$7,500.00
4.3	Elevation - Exterior	1	LS	\$142,000.00	\$142,000.00
<b>5</b>	<b>Building Improvements/Renovations (6000 SF)</b>				
5.1	Frame Roof/Replace	6000	SF	\$ 850.00	\$ 5,100,000.00
5.2	Install New Gutter System				
5.3	Seal Existing Wall Penetrations				
5.4	Install New Windows				
5.5	Update Plumbing				
5.6	Update Electrical				
5.7	Upgrad HVAC				
5.8	Replace Flooring				
5.9	Replace Interior Walls				
5.10	Replace Ceiling				
5.11	Paint Interior Walls & Ceiling				
5.12	Paint Exterior				
5.13	Fire Engine Exhaust System Relocation				
5.14	Structural/Seismic Retrofit - Add Code Compliant Second Story				
<b>6</b>	<b>Communications</b>				
6.1	Communications	1	LS	\$250,000.00	\$250,000.00
<b>7</b>	<b>Miscellaneous</b>				

7.1	Interior Furnishings (beds, desks, dressers, chairs, etc.)	1	LS	\$35,000.00	\$35,000.00
7.2	Appliances (Refrigerator, stove/oven, dish washer etc.)	1	LS	\$54,000.00	\$54,000.00
	<b>Costruction Sub-Total</b>				\$6,204,500.00
	<b>Contractor OH+Profit (25%)</b>				\$1,551,125.00
	<b>Contingency (20%)</b>				\$1,240,900.00
	<b>Total</b>				\$8,996,525.00
<b>9</b>	<b>Administration Costs (41% of Construction Total)</b>				
9.1	Design Fee				\$3,688,575.25
9.2	PM Services				
9.3	CM and Inspection				
9.4	CIP O/H				
9.5	Special Inspection				
9.6	Labor Compliance Monitoring				
9.7	PLA Compliance Monitoring				
9.8	Permit Fees				
9.9	Plan Check Fees				
9.10	Environmental				
9.11	Haz Mat Study				
9.12	Arts (1%)				
	<b>Total Estimated Project Cost</b>				\$12,685,100.25