



Texas Commission on Environmental Quality New Technology Implementation Grant (NTIG) Program

Operation Phase Annual/Final Status Report

Contract Number: 582-15-53907-1471

Grantee: Southwest Research Institute

Report for the Annual period: 2018-2019 –Third Annual Report

Date Submitted: 07/09/2019

Section I. Accomplishments

*Provide a bulleted list of operations of the facility during the past year.
Include exact numbers and/or estimates.*

Southwest Research Institute (SwRI) Fire Technology Department (FTD) installed a pollution abatement system (PAS). The start-up date of this system occurred on March 24, 2016. The PAS is a fabric-filter baghouse paired with a dry scrubbing soda ash system and an activated carbon chemical adsorption system. The purpose of this PAS is to capture and control emissions of particulate matter, as well as toxic and hazardous air pollutants from three buildings collocated in the FTD area. A schematic of the area where the system is servicing three buildings is shown in Figure 1. Current pictures of the system and its major components are shown in Figures 2 through 6.

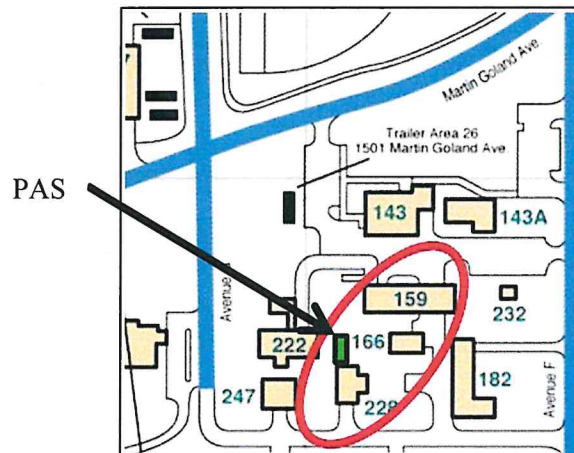


Figure 1. FTD area showing the location of the three buildings and PAS (red oval).

Testing activities performed in all three buildings associated with this PAS have been recorded. Emissions for each test event are estimated per-occurrence based on quantity and composition of materials tested. An aggregate report of the testing activities and estimated emissions in each building is submitted on a monthly basis. Due to the frequent changing nature of research projects and/or the unknown composition of some testing materials, actual emissions are not routinely determined. The following bulleted lists indicate the details associated with the three buildings (B159, B166, and 228) connected to the PAS during the period of July 2018-June 2019:

- The total number of tests performed in this period for this group of buildings was 193, of which:
 - 63 tests were performed in B159, representing 32.64% of the total tests.
A variety of fire resistance test were conducted, many in support of the automotive and wood industries.
 - 30 tests were performed in B166, representing 15.54% of the total tests.
The majority of the testing conducted was in support of battery testing.
 - 100 tests were performed in B228, representing 51.81% of the total tests.
For the second straight year, an annual record number of plastic fuel tank tests were conducted.
- Cumulative particulate matter (PM) emissions to the atmosphere were 89.93 pounds (0.045 ton).
 - The abated amount was 8,903.42 lb (4.45 ton).
- Cumulative sulfur dioxide (SO₂) emissions to the atmosphere were 5.42 pounds (0.003 ton).
 - The abated amount was 48.82 lb (0.02 ton).
- Cumulative emissions to the atmosphere of acid gases, including hydrogen bromide (HBr), hydrogen chloride (HCl), and hydrogen fluoride (HF) were 3.84 pounds (0.002 ton).
 - The abated amount was 16.54 lb (0.01 ton).
- The pressure drop and flow-rate across the Bag House are continually monitored during operations. The pressure drop is reset to 1.5 inches of water when diminished flow-rates are identified. This operational flexibility is due to the system's reverse-pulsed mechanism, which is capable of injecting air to remove the constituents captured in the filter bags. This process allows the system to quickly recalibrate proper pressure and flow rate in the system for optimal operations.

Section II. Key Events and Issues

Report any key events that occurred during this reporting period. Please include any major project updates that impacted operations.

During the most recent annual reporting period, a key card access was installed for the ancillary control system building. This addition restricts access to the control panel during daily initialization and manual adjustment of Bag House settings. The purpose of this modification is to ensure that only properly trained facility staff are able to adjust settings for Bag House operation. The results of this modification have successfully minimized visible emissions during routine/non-upset operations.

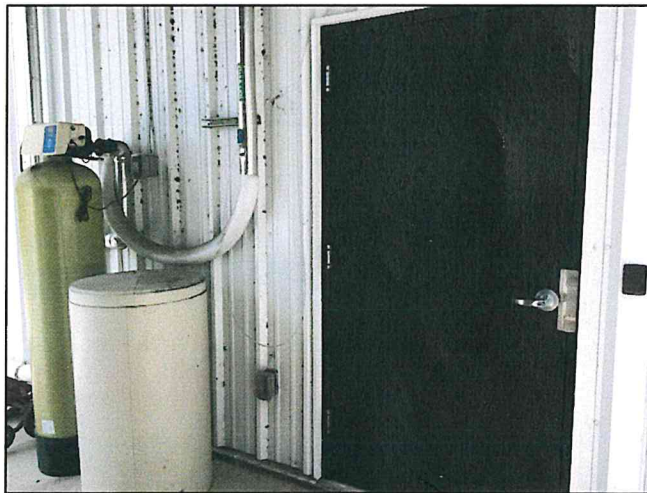


Figure 2. Photograph of ancillary quench water conditioning system and control building with keycard access.

Report any anticipated or unanticipated problem(s).

SwRI's FTD currently does not anticipate any problems with the proper functioning of the system. Routine checks and maintenance keep the system and its components properly operational. Most recently, an occurrence of excessive opacity

(visible emissions) occurred due to improper Bag House control settings. These settings were manually input to the system at the start of daily operations. This opacity event was properly reported to the TCEQ's regional office.

Proposed Solution(s): Report any possible solution(s) to the anticipated or unanticipated problem(s).

The protocol to operate the PAS has been changed and the system's control room now has restricted access via keycard entry, which restricts daily startup operations to trained operator staff.

Action(s) Conducted and Results: Describe the action(s) taken to resolve the anticipated or unanticipated problem(s). Were the actions successful in resolving the problem?

- By restricting entry to the control system, the issue of improper initial settings for the Bag House has been minimized.
- The PAS has been operating properly with no problems during the 2018-2019 period, other than the minor issue described above which led to the excess opacity event.

Section III. Provide a summary of the overall state of the facility and grant funded equipment.

The PAS has been working properly during the 2018-2019 period. The system has experienced no downtime in the last 12 months. Routine checks and maintenance have been conducted, as recommended by the manufacturer.

This system has enabled the FTD to expand its capabilities to include high-smoke products, fiberglass-reinforced plastic, penetration sealants, electrical cables and lithium-ion storage batteries. Figures 3 through 5 show the current physical state of the system with all photographs being current as of 06/28/2019.



Figure 3 . Photographs of Pollution Abatement System and its components looking south (left photo) and looking northeast (right photo).



Figure 4. Photographs of the fan and hopper.



Figure 5. Photographs of the supplementary ductwork, dampers, and valves.

Section IV. Goals and Issues for Upcoming Period

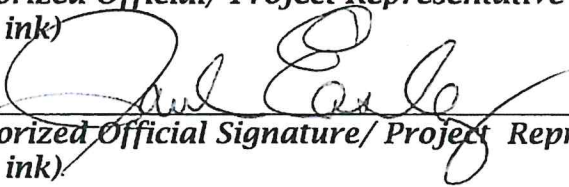
Provide a brief description of the project goal(s) you hope to realize during the next reporting period.

The overarching goal is to keep the system operating at optimal condition. For this, an assessment of the components is routinely performed to identify any potential issues.

An important goal for the system is to ensure that preventive maintenance is being performed on a scheduled basis. This will be done to ensure that unintended downtime is avoided and to extend the life of the system.

Paul Easley, Vice President of Facilities and Services

*Authorized Official/ Project Representative's Printed name
(blue ink)*



Date: July 8, 2019

*Authorized Official Signature/ Project Representative's name
(blue ink)*

NOTE: *Please attach any additional information that you feel should be a part of your report.*

This form may be submitted via e-mail to your Grant Coordinator or a paper copy may be sent to the following address:

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