



water & air
RESEARCH, INC.

*Environmental Engineers,
Scientists, & Planners*

September 26, 2012

Sam Bridges
Land Rights Coordinator
City of Gainesville
PO Box 490
Gainesville, FL 32602

Re: Soil and Groundwater Testing Report for Layton Army Reserve Center
1125 NE 8th Avenue
Gainesville, Florida
Project No. 12-5373-04

Dear Mr. Bridges:

Water & Air Research, Inc. (Water & Air) is pleased to present this Limited Environmental Site Assessment Phase II Report summarizing results and findings of recent soil and groundwater testing completed at the Layton Army Reserve Center (LARC) site. The reported property uses included storage of fuels and maintaining an oil/water separator.

1 SITE BACKGROUND

Based on documentation provided by The City of Gainesville (The City) and forwarded by the Army Reserve, the site was developed in the early 1950s as an Army Reserve base. Site operations included training of personnel, storage of equipment, vehicles, chemicals, and fuels. The facility maintained several underground storage tanks (USTs) and aboveground storage tanks (ASTs), operated an oil/water separator, and reportedly had some minor leaks and spills during operations. The documentation showed closure activities, including testing, were completed to show if any impacts such as a spill or leak had occurred for all potential impact areas, except for two areas.

An UST was discovered during the decommissioning of the oil/water separator. The tank was removed, and soil samples were screened for petroleum vapors. The screening showed that no contaminants had leaked from the tank; however, no groundwater sample had been collected, and no samples were taken down gradient from the former UST and oil water separator system.

A former heating oil AST was in use for the property on the south side of the structure. The tank had been removed, but no soil or shallow groundwater testing was found.

The following work scope was completed in the two areas identified with potential recognized environmental concerns (RECs).

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2 PHASE II ENVIRONMENTAL SITE ASSESSMENT ACTIVITIES

Soil and groundwater testing was completed at the LARC site to determine if impacts from the former oil/water separator system and the former fuel oil tank used at the property had occurred.

The site assessment work scope included:

- Completing nine soil borings into the water table or refusal,
- collecting soil samples for field testing using an organic vapor meter (OVM),
- analyzing select soil samples for laboratory testing, and
- collecting groundwater samples for analytical laboratory testing.

2.1 Soil Sampling, Field Testing, and Analytical Methods

On July 20, 2012, Water & Air completed nine soil borings at depths ranging between six and 13 feet below land surface (bls). Soil samples were collected in accordance with Florida Department of Environmental Protection (FDEP) Standard Operating Procedures (SOPs). Soil borings OSW-1 through OSW-4 were completed around the former oil/water separator system. Soil borings HO-1 through HO-5 were completed around the former aboveground heating oil tank pad.

Soil borings were advanced using a hand auger. Soil samples were collected at two-foot vertical intervals for field screening with an OVM equipped photo ionization detector (PID). The PID was calibrated in the field according to manufacturer specifications. Soil samples for OVM field screening were collected above the water table. The water table was encountered at approximately 8.5 to 10 feet bls.

Soil samples for laboratory analysis were collected from the sample interval with the highest recorded reading on the OVM or in the location most likely to have contamination.

None of the soil samples collected registered readings above background levels on the OVM. The soil sample from the area of the oil/water separator (OSW-3-8) was collected above the water table from the boring located in the center of the former UST.

The former heating oil AST location was identified on a map forwarded by The City. The soil sample from the heating oil AST was taken above the water table from the boring located in the expected down gradient south end of the former tank pad.

Soil boring locations OSW-1 through OSW-4 and HO-1 through HO-5 are shown on Figure 1.

Soil sample OSW-3-8 (boring 3 at eight feet bls) was analyzed by EPA Method 8260 (full list) for volatile organic aromatics (VOAs), EPA Method 8270 for semi-volatile organic carbons, FL-PRO for TRPH (total recoverable petroleum hydrocarbons), and EPA Method 6010 for arsenic, cadmium, chromium, and lead.

Soil sample HO-1-8 (boring 1 at eight feet bls) was analyzed for EPA Method 8260 for VOAs, EPA Method 8270 for semi volatile organic carbons, and FL-PRO for TRPH. The field notes, instrument calibration log, and boring logs are provided in Appendix A.

Soil borings OSW-1, OSW-3, HO-1, and HO-4 were further advanced into the water table to depths between 13 and 13.5 feet bls. Temporary monitoring wells were constructed using ten feet of two-inch diameter PVC screens (0.01-inch slot size) attached to 2-inch diameter PVC riser pipe extending to the surface. A 20/30 filter sand pack was placed in the annular space between the borehole and the well screen. The wells were developed using a peristaltic pump until clear.

2.2 Groundwater Sampling and Analytical Methods

On July 23, 2012, groundwater samples were collected from the four temporary monitoring wells. The oil water separator UST wells (OSW-1 and OSW-3) groundwater samples were analyzed by EPA Method 8260, EPA Method 8270, FL-PRO, and EPA Method 6010. The heating oil AST wells (HO-1 and HO-4) groundwater samples were analyzed by EPA Methods, 8270 and FL-PRO. The field notes, instrument calibration log, and groundwater sampling logs are provided in Appendix A.

3.0 SITE ASSESSMENT RESULTS AND FINDINGS

The following section summarizes the results and findings of the additional site assessment technical activities.

3.1 Soil Testing Results and Findings

Soil testing OVM results did not record any reading above background levels.

Soil analytical results from borings installed at the former oil water separator UST OSW-3-8, and heating oil AST HO-1-8 did not identify any parameters above the laboratory practical quantitation limits or the soil cleanup target levels (SCTLs) list in Florida Administrative Code (FAC) 62-777.

The soil analytical laboratory report and chain-of-custody form are provided in Appendix B.

3.2 Groundwater Results and Findings

Groundwater analytical results from oil water separator UST OSW-1, OSW-3, and the heating oil AST HO-1 and HO-4 were reported below the laboratory practical quantitation limits and the groundwater cleanup target levels (GCTLs) set forth in FAC 62-777 for the parameters analyzed.

The groundwater analytical laboratory report and chain-of-custody form are provided in Appendix C.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the testing results of soil and groundwater in the REC areas of the former oil/water separator and the former fuel oil AST, no adverse impacts from these two areas were identified.

If you have any questions or need additional information, please contact myself or Simon Cordery.

Sincerely,
 Water & Air Research, Inc.

Simon Cordery
 Scientist II

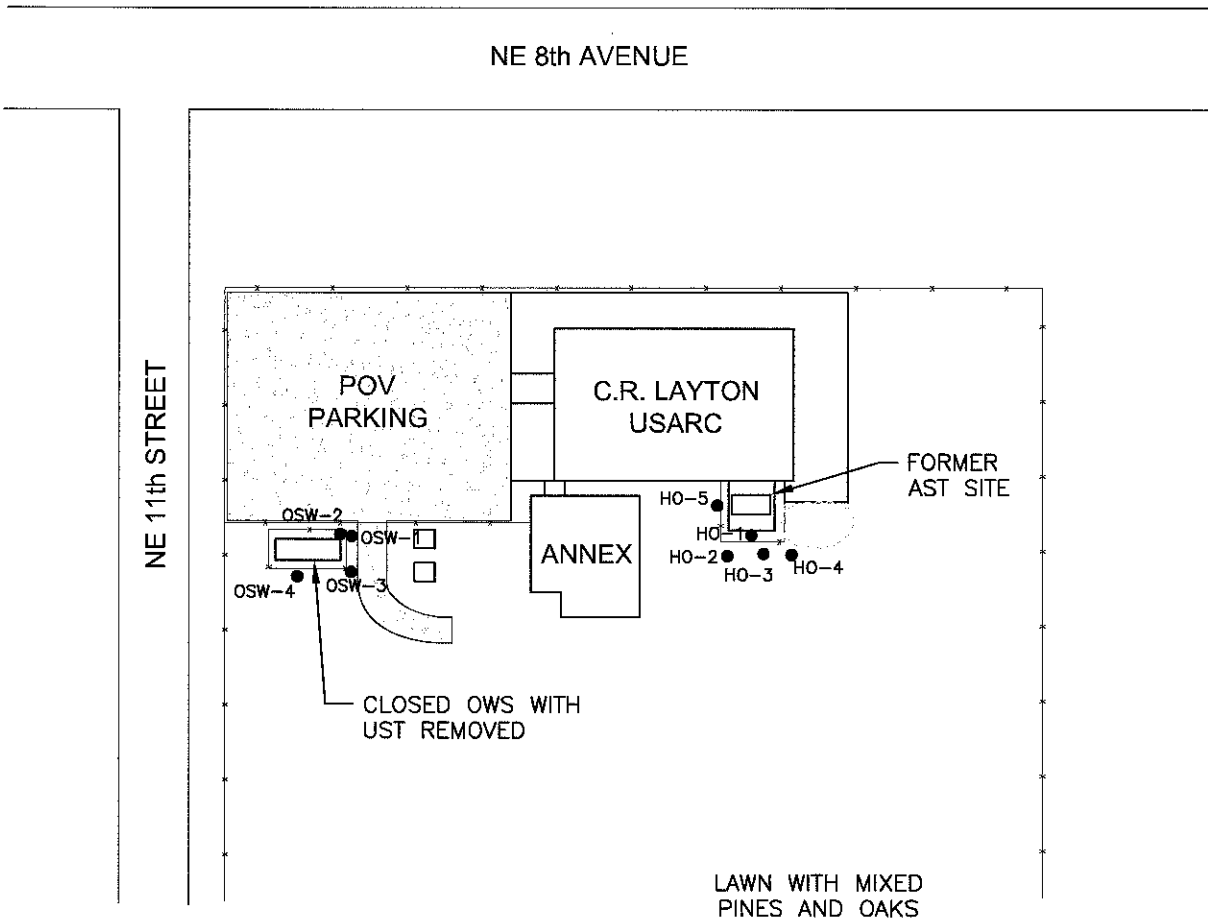
Attachments:

Figures:

- 1 Site Layout Showing Soil Boring Locations

Appendices:

- A Field Notes, Instrument Calibration Logs, Boring Logs, and Groundwater Sampling Logs
 B Soil Laboratory Analytical Report and Chain-of-Custody
 C Groundwater Analytical Laboratory Report and Chain-of-Custody



LEGEND
 HO-4 ● SAMPLING LOCATION

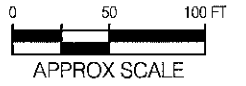


FIGURE 1.
SITE LAYOUT SHOWING SAMPLING LOCATIONS
C.R. LAYTON USARC
GAINESVILLE, FLORIDA

Source: Water & Air Research, Inc., 2012.





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The City of Gainesville/ Army Reserve Center Evaluation

Sampling & Analysis

This sampling was based on a request from Sam Bridges of The City of Gainesville Public Works (The City). The request was based on the possible reverting back to The City of the Army Reserve Center at 1125 NE 8th Avenue in Gainesville, Florida. Water & Air Research (Water & Air) conducted limited Phase II sampling of the property on behalf of The City including air testing, before formally taking ownership of the property and any on-site conditions. The request for air sampling is based on former conditions documented during the operational history of the facility since the early 1950s. Mold sampling was conducted and the presence confirmed in the 1990s. Cooled air from the office was mixing with the warm, moist air of the central bay of the facility causing condensation and eventually mold. The mold was addressed and air conditioning units for the central area were installed.

None of the air conditioning or fan units were in operation at the time of the Water & Air sampling and had been off for approximately one week. The doors segregating the offices from the central area were open upon arrival for sampling. The weather was in the low 90s, humid with occasional light rain. Humidity in the sample areas varied from between 76% and 93%

On July 19, 2012, Water & Air took eight (8) air samples from the first, second, and sub-first floor areas. A ninth sample was taken as a background sample and was collected outside approximately 75 feet from structure and away from any vegetation. Air samples were collected from random varied areas and in specific areas when conditions indicated the potential for mold spore proliferation. Air samples were taken using an Air-O-Cell Sampler to collect airborne particulates for analysis by Optical Microscopy. The samples were collected by using a vacuum to draw air through the Air-O-Cell. The vacuum is operated at a specific rate so the volume of air can be determined. This test ran for 10 minute per sample at a flow rate of 15 liters per minute. The samples were sent to EMSL Analytical laboratories in Orlando Florida for analysis. The particles were analyzed by spore type and count to determine if a mold problem exists based on calculated averages for buildings in Florida and an outdoor background sample. This type of test does not determine species.

There were no obvious signs of mold other than on some vent registers on the second floor and on duct work where insulation had fallen off. Some rust was observed on the door casing of Room 209 on the second floor which was assumed to be from moisture from the air conditioning system air encountering warmer air outside the door.

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Results

Air Samples

Below are the types or counts from each sample that differed from the background sample.

Location	Air Samples Species	CFUs/M ³
Layton Army Reserve Center:		
AR 104A:	none	
AR 209:	<i>Alternaria</i> *	21
AR 104:	<i>Aspergillus/Penicillium</i> **	686
AR 212:	<i>Aspergillus/Penicillium</i> **	125
	<i>Cladosporium</i>	21
	<i>Torula</i>	7
AR range:	<i>Basidiospore</i> **	478
	<i>Chaetomium</i> *	21
	<i>Cladosporium</i> *	146
	<i>Pithomyces</i> *	21
AR 100:	<i>Aspergillus/Penicillium</i> **	62
	<i>Basidiospores</i> **	104
AR 217:	<i>Alternaria</i> *	21
	<i>Stachybotrys</i> *	21

AR 117:

<i>Alternaria*</i>	7
<i>Aspergillus/Penicillium**</i>	21
<i>Basidiospores**</i>	145
<i>Cladosporium*</i>	42
<i>Epicoccum*</i>	21
<i>Pithomyces*</i>	21

* indicates this spore type was not seen in the background sample. Count indicated.

** indicates the count of this type of spore exceeded the background and by how much.

Most all of the fungi present in this study can serve as allergens if they build up in high populations. The threshold level of allergy patients is variable, and exceptionally high numbers of spores may induce allergic responses even in healthy individuals. A large number of fungi, however, may become opportunistic pathogens if a person's immune system is compromised or if there are persistent inflamed areas on which these fungi may encroach as a secondary invader.

The above count does not include pollen which was identified in low amounts in some indoor samples. Pollen is not unusual at this time of year however, it was unusual not to see any in the outdoor background sample.

Conclusions

The array of spore types identified and quantified in most of the rooms are similar to those identified in the outdoor air sample. This information indicates the air in the interior of the building is impacted by outdoor air intrusion. Also, there are spore types not seen in the background sample or in higher numbers than the background sample indicating possible mold colonies with their attendant moisture sources.

There are no government issued numerical standards for mold interpretation. However, some environmental companies, industrial hygienists, and other indoor air quality professionals use the following arbitrary numbers for guidance in interpreting spore survey results:

- < 250 spores per cubic meter Low/Normal
- 250 to 1000 spores per cubic meter Moderate/Borderline
- > 1000 spores per cubic meter Active sporulation
- > 5000 spores per cubic meter Very active sporulation

Applying this guidance, there may be active sporulation in Rooms 104 and the old gun range.

As we compare the above data with those recorded from the interior areas at the facility taken on July 19, 2012, spore counts and types at this site are slightly higher than the expected range for a public building even considering the mixing of the air with the outside.

A building is not a sterile environment, nor should it be. In fact, a building is frequently a reservoir for microorganisms. While many different types of microorganisms occupy indoor spaces, it is well-recognized that fungi can colonize and grow on a variety of building materials if sufficient nutrients and moisture are present. These contaminated materials are known to be important indoor reservoirs.

The following table provides information on common environmental fungi that have been isolated from wetted wallboard:

Organism	Materials That Support Growth
<i>Acremonium spp.</i>	Colonizes damp wallboard
<i>Alternaria spp.</i>	Grows indoors on a variety of substrates
<i>Aspergillus spp.</i>	Colonizes damp wallboard
<i>Chaetomium spp.</i>	Commonly found on damp wallboard paper
<i>Cladosporium spp.</i>	Colonizes continuously damp wallboard
<i>Epicoccum spp.</i>	Colonizes continuously damp wallboard
<i>Fusarium spp.</i>	Colonizes continuously damp wallboard
<i>Penicillium spp.</i>	Commonly found on damp wallpaper
<i>Stachybotrys spp.</i>	Colonizes continuously damp wallboard
<i>Trichoderma spp.</i>	Grows well on damp wallboard paper

At the City Army Reserve building, *Alternaria*, *Aspergillus/Penicillium*, *Chaetomium*, *Cladosporium*, *Epicoccum*, and *Stachybotrys* were found. However, only *Aspergillus/Penicillium* and *Cladosporium* were more than 100 spores per cubic meter of air. The count of *Aspergillus/Penicillium* is combined because there are no distinguishing features that would allow a separate count of each genus. Many *Penicillium* species are not associated with water damage.

Using the outside air quality as a guide, we find a high level of Ascospores (primarily plant pathogens that rarely grow inside). *Aspergillus/Penicillium* inside the building is generally higher than expected from only dilution of outside air. This is commonly caused by colonies of *Penicillium* associated with food waste, but cannot be verified in this case without performing other tests.

Cladosporium levels over 100 spores per cubic meter of air are found only in three rooms. Its ability to get airborne makes it an important fungal allergen.

The presence of *Stachybotrys* in two of the rooms is important because it is difficult to make its spores airborne and studies to date suggest it produces mycotoxins under certain environmental conditions. Caution should be taken when dealing with this fungus because exposure to the toxins can occur through inhalation, ingestion, or skin exposure.

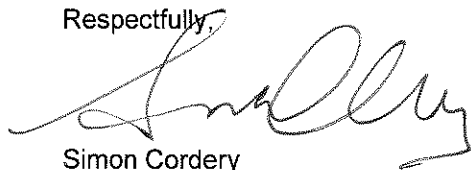
Remediation

Based on the results of this sampling and observations made during the site visit, Water & Air recommends turning the air conditioning system back on to lower both the moisture in the air and the temperature. Also, clean any obvious areas of mold, such as the vents, and replace any insulation that had fallen off of the duct system. An inspection of the facility for water damage or water intrusion to prevent fungal growth is recommended.

Water & Air has used DUCTZ Indoor Air Professionals for local cleaning of duct work and mold-impacted surfaces.

Based on the analytical results, addressing the above conditions should occur before any regular inhabiting of the structure.

Respectfully,

A handwritten signature in black ink, appearing to read "S. Cordery", written over the word "Respectfully,".

Simon Cordery

Environmental Scientist II

Water & Air Research, Inc.

September 25, 2012