

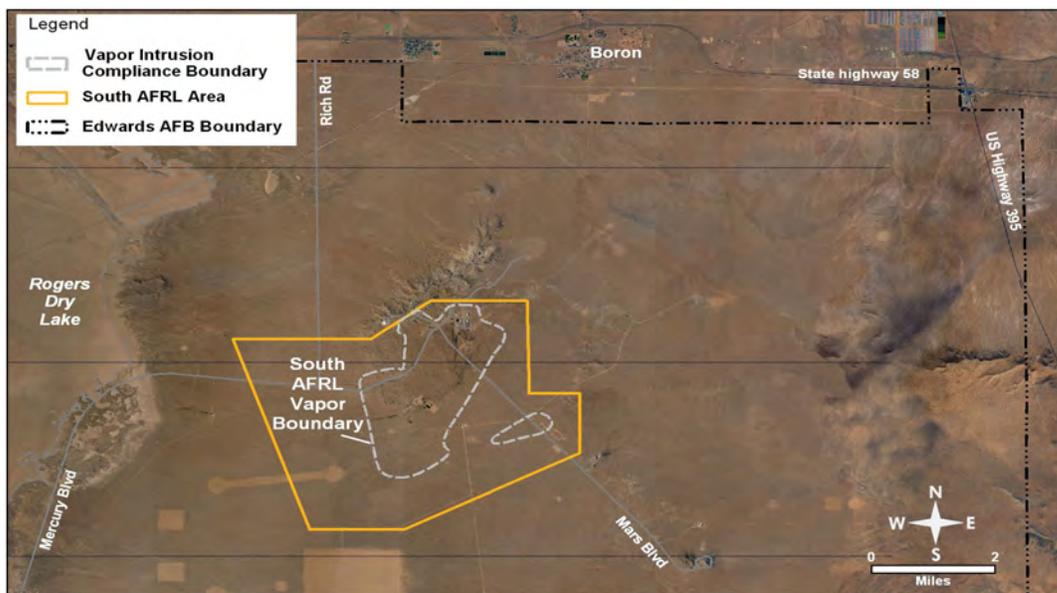


ERP Fact Sheet

May 2009

This Fact Sheet addresses new requirements for vapor assessment at the South Air Force Research Laboratory, Edwards Air Force Base.

Base to conduct vapor assessments at South Air Force Research Laboratory



An overhead view showing the vapor boundaries (gray dashed lines) within the South AFRL area (yellow line). Occupied buildings in these areas will be sampled for vapor concentration levels.

Air Force officials will perform vapor assessments in the southern portion of Air Force Research Laboratory (South AFRL), Edwards Air Force Base, as part of the area's cleanup plan.

Base environmental experts plan to take a combination of outdoor soil vapor samples and indoor air samples in occupied buildings to measure the concentrations of volatile chemicals (if present) and assess whether they pose any risk to building occupants. These assessments will determine if any preventative measures need to be taken to protect human health.

To comply with the most protective part of the risk range allowed under the *Superfund Act*, chemical vapors intruding from the

sub-surface into work areas should pose no more than a one-in-a-million health risk to

Buildings to be Evaluated

The following buildings are located within possible vapor pathway areas:

8349	8356	8407
8350	8402	8408
8351	8403	8411
8352	8404	8595
8353	8405	8620*
8354	8406	8765*

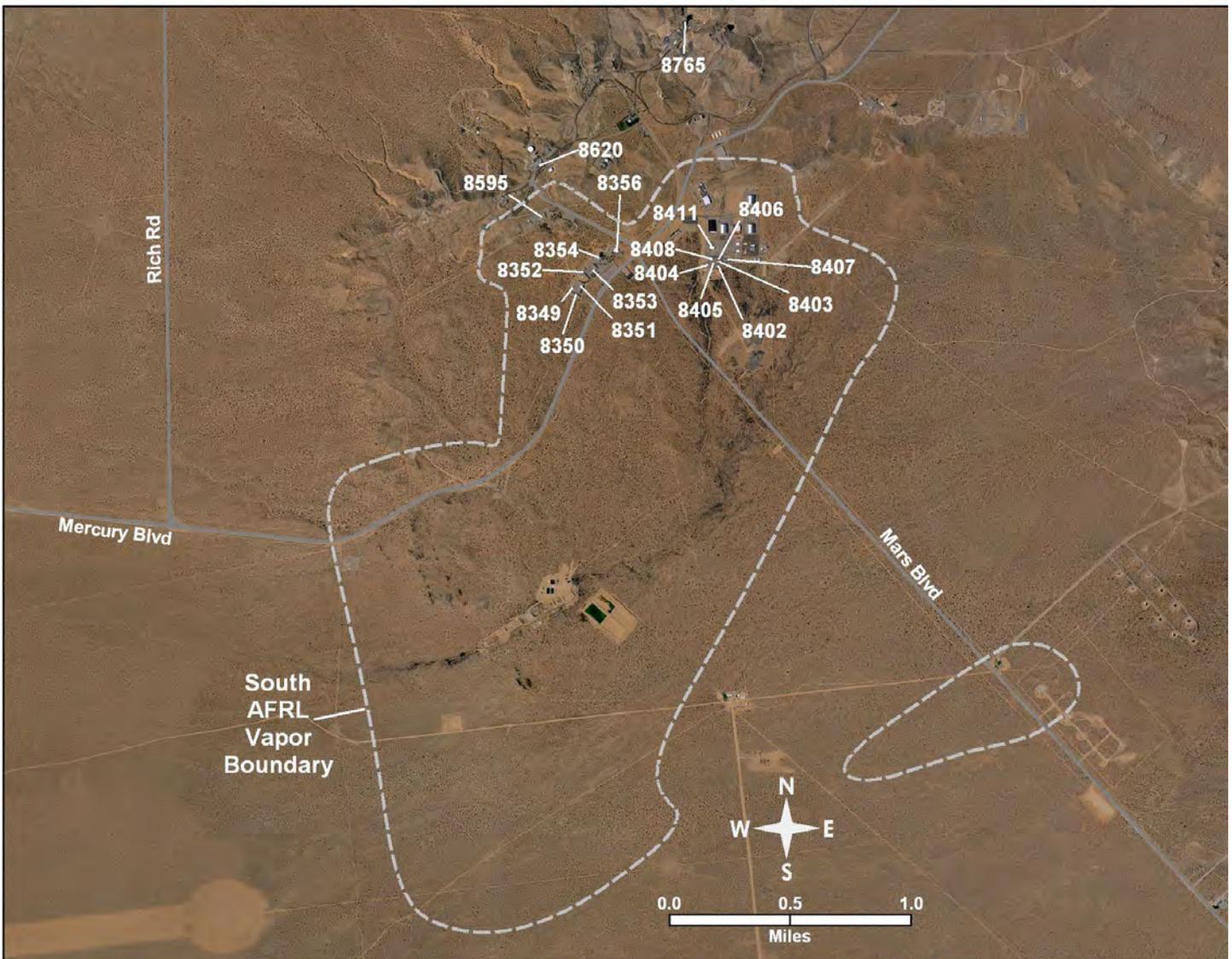
* Buildings located outside of the South AFRL area.

For more information, contact:

Gary Hatch

5 E. Popson Ave., Bldg. 2650A
Edwards AFB, Calif. 92324-8060

E-mail: 95abw.pae@edwards.af.mil



There are 16 occupied buildings within the South AFRL vapor boundaries (gray dashed lines). Buildings 8620 and 8765 belong to another cleanup area called AFRL Arroyos. Indoor air samples also will be taken in those two buildings.

employees. This equates to one person in one million developing cancer if exposed to chemical vapors continuously for 10 years.

Established in 1980, the *Superfund Act* is a law that dictates how historical hazardous waste should be cleaned up and requires the parties responsible for the contamination to conduct or pay for the cleanup.

The conservative risk level is designed to be very protective of human health. An employee's risk

level is based on an assumed continuous exposure of 8 hours per day, 250 days a year, over a 10-year period.

Soil vapor samples to screen for the presence of volatile organic compounds (VOCs) that could potentially migrate into indoor air will be taken in the vicinity of buildings overlying soil or groundwater plumes containing VOC contaminants. Analysts have defined areas, called vapor boundaries, where South AFRL

groundwater contains VOCs at concentrations that potentially pose a risk to indoor air for industrial use. None of the groundwater inside the South AFRL is used for drinking water.

In some cases, sub-slab sampling will need to be performed to get an accurate assessment of whether VOCs are present in vapor beneath the building. Sub-slab sampling involves the drilling of small-diameter boreholes through the building's floor-

ing. This procedure, combined with indoor air sampling, provides the quickest method of accurately assessing if vapors are present.

Because of their chemical properties, VOCs can vaporize out of the groundwater and enter into the gaseous phase of the underlying soil. The chemicals in the soil gas can then move both vertically and horizontally through the soil.

Building entry occurs when chemical vapors from groundwater and subsurface soil leak through cracks and holes in a building's structure. As a result, people working in buildings above such areas could be exposed to chemicals through inhalation.

The most common VOCs found at South AFRL are tetrachloroethene (PCE) and trichloroethene (TCE). These chlorinated solvents were used for years to clean grease off engines and other parts at South AFRL.

Based on historic practices, Building 8595 was suspected to contain the highest vapor concentrations. The building was the source of a past chemical spill and had once been used to clean rocket parts. For this reason, vapor assessments were conducted at Building 8595 from 2003 to 2005, before the area's cleanup plan was written.

Some of the indoor air samples were taken under worst case conditions, with the building ventilation and nearby soil vapor extraction system turned off. One such 22-hour test revealed a spot in the building that measured 4.7 micrograms of PCE vapor per cubic meter, the highest concentration measured throughout Building 8595.

At the time, concentration levels within the building were considered safe and well within the risk range considered acceptable. In 2005, these findings were briefed to the commander and AFRL employees.



Historical pictures of Building 8595 show indoor caustic and acid dip tanks and a sump with overlying grate before (top left photo) and after cleaning (top right photo). The building has since been renovated and now offers a cleaner work environment (bottom photo).

Since then, Edwards AFB and federal and state regulatory agencies have jointly agreed to adopt the most conservative end of the risk range for the protection of employees that work in AFRL buildings. In addition, the model used to calculate risk based on soil and groundwater concentrations was reformulated to assume a greater rate of vapor intrusion into the indoor air.

So, vapor concentration levels at

South AFRL have not changed since 2005, but regulatory agencies have become more conservative about the level of risk considered acceptable. Currently, the 4.7 micrograms equals a cancer risk level exceeding one chance in one million, based on 10 years of continuous exposure.

Ensuring a safe work environment for employees is a priority. Air Force actions will be more protective of



human health than is required by law.

Several steps will be taken at Building 8595 to prevent exposures to indoor PCE vapor concentrations exceeding 1.7 micrograms per cubic meter. The Air Force will continue to monitor indoor air levels and installed four wells in the building to measure sub-slab vapor concentrations. Officials are going to evaluate and utilize the soil vapor extraction system near the building. The system may act to reduce the vapor concentration under the building.

Experts also will evaluate the current ventilation system to see if modifications could increase the exchange rate of air within the building. This will allow better circulation of outside air into the building, thereby lowering vapor concentrations.

Other occupied buildings will receive the same protective treatment if indoor air exceeds risk levels. Officials plan to continue monitoring and will apply engineering controls to keep vapor concentrations below the risk level.

Engineering controls such as vapor barriers, sub-slab depressurization and ventilation design will be a prerequisite for new structures built within the vapor boundary areas.

In 2012, South AFRL will undergo a five-year review. During this time, base restoration officials will determine if the vapor assessments at South AFRL have been effective in protecting human health. They also will look for ways to improve the performance of the actions in place by researching if newer vapor technologies have become available.

Results of the five-year review will be shared with state and federal regulators. Similar reviews will continue indefinitely every five years until all of the contamination at South AFRL is cleaned up.

More Information Available

The Air Force encourages the public to gain a more complete understanding of South AFRL and the cleanup activities that were conducted there. All documents that the base used to make decisions about cleanup at the South AFRL are in the base's administrative record. To view the full administrative record, you must contact Mr. Gary Hatch at:

95 ABW/PAE
Attn: Gary Hatch
5 E. Popson Ave., Bldg. 2650A
Edwards AFB, CA 93524-8060

Phone: (661) 277-1454

Fax: (661) 277-6145

E-mail: 95abw.pae@edwards.af.mil

To view a subset of decision documents, you may also visit one of the other Information Repository locations listed in the box below.

Information Repositories:

Edwards AFB Library
5 W. Yeager Blvd.
Building 2665
Edwards AFB, Calif.
(661) 275-2665

Kern County Public Library
Wanda Kirk Branch
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Rosamond, Calif.
(661) 256-3236

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(661) 948-5029