



washington **river**
protection solutions



Pictured is the AP Farm Crash Gate on the South Side of the Farm. Crash gates were installed as part of the Public Address System installation, see [KPP 5](#). (Photo courtesy of Gregory N. Hanson.)



Tank Operations Contract
Chemical Protection Program Office
June 14, 2018

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

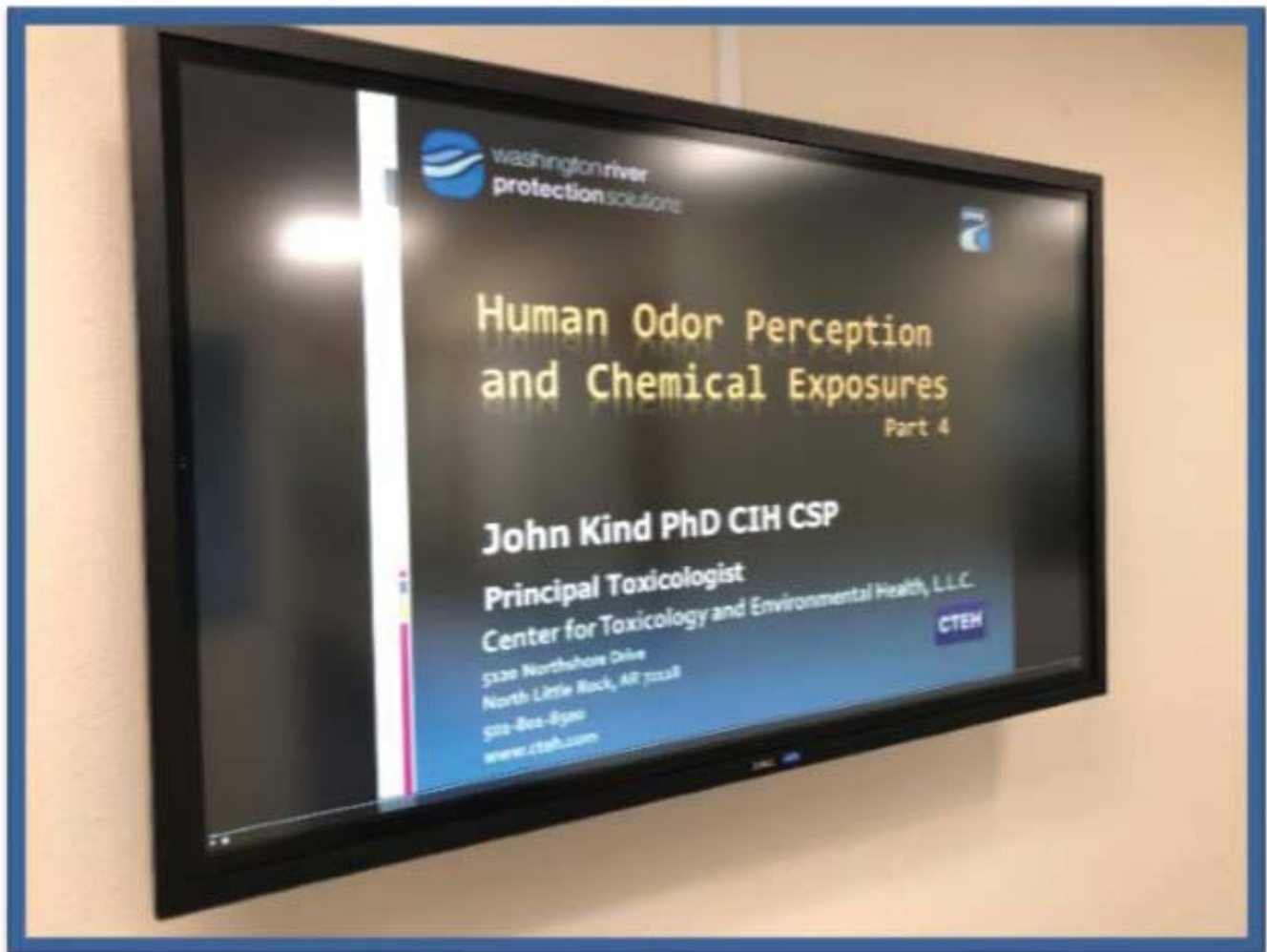


Figure 1. CPPO Notebook titled *Human Odor Perception and Chemical Exposure, Parts 1- 4*, developed by Dr. John Kind, CTEH, is available on a change trailer reader board.

Beginning last week, some CPPO Notebooks are available for viewing on the reader boards located in eight trailers. **Figure 1** depicts the reader board in the AW Farm MO 818 change trailer.

Based on requests from the field, links to the CPPO Notebook are now included in the Safety Startup.

CPPO Oversight and Tracking

External Assessments Recommendations Status

Figure 2 shows that the Hanford Vapors website logged over 2240 views in May 2018, a drop of one third from the previous month. In May, the website experienced an average of 72 hits-per-day. The daily web traffic observed for this month is also below the average hits-per-day for the Fiscal year-to-date (102). May represents the second lowest usage of the website over the past twelve months.

C&PR reported the following 11 items were posted to the site this month:

- [Population Health Trending Summary, Tank Farm Hazardous Waste Worker](#)
- [CPPO Weekly Report - Feb. 22, 2018](#)
- [CPPO Weekly Report - March 1, 2018](#)
- [CPPO Weekly Report - March 8, 2018](#)
- [CPPO Weekly Report - March 15, 2018](#)
- [CPPO Weekly Report - March 22, 2018](#)
- [CPPO Weekly Report - April 26, 2018](#)
- [CPPO Weekly Report - May 3, 2018](#)
- [CPPO Weekly Report - April 19, 2018](#)
- [CPPO Weekly Report - April 12, 2018 - CPPO FY18 2nd Quarter Summary](#)
- [Vapors Weekly Update May 16, 2018](#)

Traffic was significantly elevated on May 21, however no new items were posted that day and the detailed data regarding which pages were visited is not currently available.



Figure 2. Hanford Vapors Website Statistics May 2018

Data Access Visualization (DAV) Tool

Sub-contracted by the CPPO, Pacific Northwest National Laboratory (PNNL) built and successfully launched the DAV Tool early in FY2018. Engaging the user by interactive access to historical and current tank vapor samples, monitoring results, and visual representations of relevant data and contextual information, the DAV Tool promotes transparency. This sophisticated tool avails the data to the user with little technical background, and allows the more technically sophisticated user to drill down to detailed content. The DAV Tool is on the HanfordVapors.com website. May 2018 DAV Tool statistics, as provided by Google Analytics, are shown in **Table 1**.

Table 1. DAV Tool Use Statistics for May 2018: www.TankVaporsExplorer.com

2018	Total Page Views	Most Popular Feature	Second Most Popular Feature	Most Popular Region	Other Regions	New Users	Returning Users
May	166 Hits	Chemical Selection: Chart Type: Headspace/ Source vs. Area specifically Ammonia (7664-41-7)	Explorer-Set-Filter Explorer-Set-Filter is where the user is actively filtering on COPC Chemicals or All Chemicals.	*Washington State	Kansas California Iowa New Mexico Pennsylvania Virginia	53%	47%
<p>*May Washington State Breakdown:</p> <p>1. Total Page Views: 151 (91%) Average Session Duration: ~5 min</p> <p>2. Total Unique Users: 36 Region/Marketing: Yakima-Pasco-Richland-Kennewick: 35 Seattle-Tacoma: 1</p> <p>3. Page views by Region Yakima-Pasco-Richland-Kennewick: 144 Seattle-Tacoma: 7</p> <p>4. New vs Returning Users Yakima-Pasco-Richland-Kennewick Seattle-Tacoma New Users: 1 Returning Users: 0 87% of referred traffic is coming from: hanfordvapors.com</p>							

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Engagement and Effective Measurement

✦ Chemical Protection Engagement: Center for Toxicology and Environmental Health (CTEH)

Update:

Toxicologists Dr. Angie Perez and Dr. Christopher Kuhlman were the CTEH representatives on site last week. CTEH continued developing CPPO Notebooks on topics such as tank farm vapor chemical characterization, and on how air purifying respirator cartridges work. They attended the CVST Communications Sub-committee meeting on June 4, and introduced themselves as an ongoing resource for toxicology-related inquiries. Drs. Perez and Kuhlman hosted on-site office hours at the CPPO satellite office located in 2750E A230, available to answer toxicology- and vapors-related questions from workers.

Key Performance Parameter 1
Establish a comprehensive vapor management communication plan, engagement processes, and effectiveness measurements.

✦ Chemical Protection Engagement: Communications

Update:

Last week's CPPO Notebook is titled *Nitrous Oxide – Part 2*, and was developed by CTEH as part of the ongoing series on COPCs.

An Industrial Hygiene *Communication* was sent as an all-employee email on June 4, 2018, titled, "Monthly Routine Testing Results – Chemical and Bacteriological Testing –Respiratory Protection Equipment and Surfaces. April 2018" The email directs the reader to the mask issue stations and the WRPS Intranet for results of the monthly testing.

On June 5, 2018, Shift Office Event Notification (SOEN) stated, "Cleared stop work on use of APR based on issuance of required reading communicating proper inspection and handling of APR cartridges."

✦ Chemical Protection Engagement: Chemical Vapors Solutions Team (CVST)

The CVST Communications Sub-committee held a meeting on June 4, 2018.

Communications, IH Programs, Management, Operations, HAMTC Safety Representatives, Nuclear Chemical Operators, Radiological Control Technicians, and CPPO were in attendance, as well as a number of the Team Vapor Representatives. The Communications lead provided status on ongoing litigation, AP Farm FFAPR rollout, evaporator campaigns, and the cartridge stop work.

Questions were brought up regarding the sunshields and why they are not allowed for use. The Chemical Protection Integration Manager said he would discuss this with management. Status was requested on visiting the mask cleaning station to review the mask cleaning process; the Communications lead said that C&PR is currently working on a video that will show the process. Feedback from the workforce in attendance was that a video is preferred over visiting the cleaning facility. Status was requested on why the mobile lab would no longer be operated by RJ Lee, and was it because of issues with the lab equipment. The Chemical Protection Integration Manager said there were no issues with the equipment or data. It was simply a business decision for WRPS to construct its own mobile lab. A comment was also made by the workforce that they appreciate the recently released IH Communications describing the monthly routine testing process for respiratory protective equipment. The group discussed re-emphasizing the importance of a questioning attitude at Plan-of-the-Day (POD) meetings to ensure all activities are understood. Members of the CPPO in attendance also requested feedback on recent site briefings provided at the PODs and the inclusion of notebooks in *Solutions*; none of the members in attendance had attended a site briefing and could not provide feedback. Additionally, CPPO team members let attendees know that CTEH has office hours at the site once-per-week to answer questions, and that CPPO materials would be available on screens at site trailers.

Chemical Protection Engagement: Hanford Vapors Website Updates No Updates Reported

Chemical Protection Engagement: Effectiveness Measures **Update:**

The results of the FY2018 *Vapors Information Effectiveness Survey Report* are being implemented by CPPO. Actions taken in **May and June** in response to the survey recommendations include the following:

- Scheduling site visits to individual worker groups to increase worker access to CTEH experts, increase awareness of the CPPO, and where to locate vapors information
- Working with C&PR to include information on CPPO and the Notebooks in the WRPS facility building monitors
- Including the CPPO Notebooks on reader boards in change trailers
- Including CPPO Notebook summaries with links to the audio file in *Solutions* (one of the top three avenues used by workers to obtain vapors information)
- Including CPPO Notebooks in the Safety Startup
- CTEH office hours at the CPPO satellite office on-site

A second survey/focus group(s), informed by the results of the *FY2018 Vapors Information Effectiveness Survey Report*, is planned for this summer.

Chemical Protection Engagement: Workforce Engagement

Update:

The CPPO attended the Shift Production POD meeting and provided a briefing (where approximately 25-30 members were in attendance) about the CPPO group and what vapors information products are available, and where to find them. This was the first of four meetings with the Shift Production team, which is intended to ensure all shift members have the opportunity to attend the briefing. The briefing was followed by a Q&A session, where the workforce did not have any questions.

Chemical Protection Engagement: Worker Feedback

Update:

Last week, it was reported that during an EV Team POD meeting, to which CPPO was invited, the group suggested attaching CPPO Notebooks with Safety Startup to maximize viewership. Worker feedback was acted upon, and CPPO Notebooks are provided as a hyperlink in the WRPS Safety Startup.



KPPs 2 and 3. IH Technical Basis and IH Program

IH Manual and Technical Basis

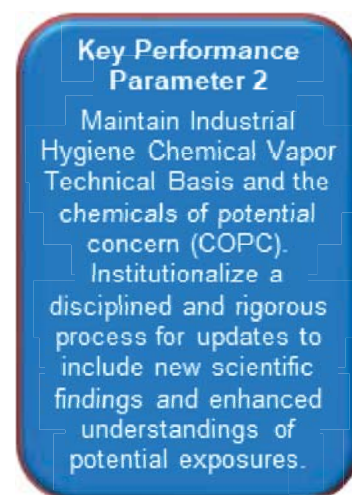
Last update 6/7/2018:

TFC-PLAN-174, *Industrial Hygiene Chemical Vapor Technical Basis Program Plan*, TFC-ESHQ-S_IH-C-66 *Identifying Chemicals of Concern in Hanford Tank Farms* and TFC-ESHQ-S_IH-C-67 *Maintenance of the Industrial Hygiene Chemical Vapor Technical Basis* are being revised to express the requirements more clearly.

Health Process Plan (HPP)

Last update 6/7/2018:

Six of the HPP studies that have transitioned in the TFC-Charter-71 process have been slated to be issued outright as version Rev 0. Three studies released at the end of May include *Proposed HTFOELs for Chronic Exposures – COPCs with Regulatory Guidelines* (PNNL-26777);



Proposed HTF OELs for Chronic Exposures - Nitrile Class COPCs and 2,4-Dimethylpyridine (PNNL-26819); and Hanford Tank Vapors FY 2017 Chemicals of Potential Concern Update (PNNL-26820). Two studies scheduled for release in June are *Proposed Acute Exposure Concentration Limits for COPCs with Regulatory Guidelines and Recommendations for Sampling and Analysis of Hanford Waste Tank Vapors.* The report *Hanford Tank Farm Occupational Exposure and Risk Assessment Plan* is in review. The studies *Proposed Risk-Based Approach for Nitrosamine Chemical of Potential Concern, Assessing the Potential for Chronic or Acute Health Effects from Exposure to COPC Mixtures,* and *Proposed Occupational Exposure Limits for Furans,* are in review by IH to assess the technical and economic impacts of implementing the study recommendations.

Leading Indicators

Last update 5/10/2018:

Pacific Northwest National Laboratory supported WRPS in improving its chemical vapors hazard management program with research, analysis, development, testing, and technical support focused on better identification and understanding of the vapor hazards. PNNL-27449, *FY18 Leading Indicator Phase 2 Report*, published last month, describes one part of an overall vapors program managed by WRPS, specifically addressing the identification of chemical vapor leading indicators (LIs). The report is part of the toolbox and technical basis used by the WRPS Industrial Hygiene group to devise processes and procedures used to limit worker exposure.

Key Performance Parameter 3

Maintain Industrial Hygiene Program and institutionalize vapor program requirements, best practices and program parity, and complete necessary training to support full implementation at the beginning of FY2018.

Air Dispersion Modeling

Last update 6/7/2018:

Industrial Hygiene submitted its final technical review of *The APGEMS – TF Atmospheric Dispersion Model for Tank Farms Applications* (PNNL-27530) and it was released at the end of May. The Air Pollutant Graphical Environmental Monitoring System (APGEMS) modeling software (version 1.0) and accompanying draft report were completed and delivered to WRPS by the Dispersion Modeling Project Team in March. The report describes the APGEMS software and discusses the technical limitations of the current version. Since then, the APGEMS software has been refined, resulting in version 1.1. PNNL delivered version 1.1 of the APGEMS-TF software for installation and testing by WRPS.

✦ Central Residence for Industrial Hygiene Technicians (IHT)

Last update 6/7/2018:

Proposals to install the centralized mobile office (MO) for the IH Technicians (IHTs) have been received and evaluated. The trailer has been constructed and is currently stored in the Pac Mobile yard in Pasco. The installation site is in the 200 East area on 4th Street near 218A across from PUREX.

Key Performance Parameter 4

Complete engineering control concept demonstrations for Strobic Air Tri-Stack® and NUCON® International, Inc. thermal combustion in support of unrestricted work boundaries.

KPP 4. Engineering Controls

✦ A Farm Exhausters

Update:

Exhausters: Over the last two weeks, crews continued constructing the A Farm exhauster retaining walls. The team poured the south retaining wall and completed the backfill and compaction between the north and south retaining walls, making ready to install the conduit.

A/AX Farm Road Expansion: The construction team backfilled and graded the A/AX Farm expansion road.

Procurement/Fabrication: A material request to procure the POR518/POR519 exhauster valve manifold and the manifold support and access platform was developed.

✦ AW Stack Extension

Update:

Over the last two weeks, the installation of the AW Farm Stack extension continued. The following was accomplished during the reporting period:

- The non-radiological and radiological permit application continues. The radiological permit is with ORP for review, and the non-radiological permit is with Washington State Department of Ecology for review.
- The stack foundation, fabrication, and installation activities continued. The site has been prepared and excavated for the foundation, with efforts on-going to install the forms and pour the concrete. The work package for the stack installation activities is still under development, while the fabrication of the stack extension continues.

✦ ¹Strobic® Air Dilution Fan

Update:

Efforts focused on the Strobic® Air Dilution Fan off-site testing. The following was accomplished over the last two weeks:

- The test plan, design, and equipment list, all in support of off-site testing, have been approved.
- Hi-Line repaired the damages to the fan incurred during shipping from the Strobic factory. The unit has been assembled and is ready for testing.

2NUCON® Thermal Oxidation Vapor Abatement Unit (VAU)

Update:

Engineering-scale testing continued, and the following was accomplished over the last two weeks:

TerraGraphics:

- Continued to provide test engineering support to PNNL for the engineering-scale testing.
- Work continued on the *Technical Demonstration Conceptual Design* for BY-108, including resolving comments from the 60% conceptual design package, and in parallel, work continues on the 90% conceptual design package.

NUCON®:

Continued to provide test engineering support to WRPS and PNNL for the engineering-scale test.

WRPS:

WRPS met with PNNL to determine a path forward for solving analytical challenges with N-Nitrosodimethylamine (NDMA), and furans encountered during the engineering-scale test. As part of the path forward, baseline exhaust (sensitivity) samples were collected and analyzed for furans by 222-S and RJ Lee Mobile Laboratory. The results confirmed the existence of furan and interferences in the exhaust gas, making the proton transfer reaction mass spectrometry (PTR-MS) capability of the NUCON® test inadequate for demonstrating furan destruction. Subsequent testing with NO⁺ reagent ion is proving to be successful in eliminating the interferences.

PNNL:

Continued implementing the engineering-scale test plan and performed the following:

- Completed NO⁺ ionization modification on the PTR-MS to facilitate more accurate analysis of 1,3-butadiene & 2,4-dimethylpyridine.
- Completed test which confirms the ability to detect 1,3-butadiene, formaldehyde, 2,4-dimethylpyridine, acetaldehyde and acetonitrile in the exhaust stream at nominally 10% or less of the OEL.
- Completed 2 times (200%) OEL test for acetaldehyde and acetonitrile.
- Provided input to WRPS work plan for resolving identity of Furan & NDMA interferences and subsequent path forward. Testing for the detection of Furan and NDMA at 10% of OEL was completed.

KPP 5. Administrative Controls and Monitoring

Permanent Installation of VMDS Equipment in AP Farm

Last update 6/7/2018:

As the month of May came to a close, efforts to obtain approvals on the Phase 2 Pilot-Scale Report, a report summarizing the results of the FY2017 pilot-scale activities, continue.

- The UV-FTIR installed at AP Farm is in the process of being turned over to Operations. The on-going activities supporting the turnover include the following:
 - The functions-and-requirements (F&R) document, RPP-RPT-60580, was approved.
 - *The Operational Acceptance Test (OAT) has been split into two separate tests to optimize approval process. The first OAT addresses startup activities where no gas testing is required, while the second OAT addresses startup activities where gas testing is required.*
 - *No-Gas Testing OAT: The OAT test procedure is currently being prepared.*
 - *Gas Testing OAT: The test plan has been completed and is awaiting to be reviewed by the Joint Test Group.*
 - Continuing to obtain approvals for the uncertainty evaluation (RPP-RPT-60669).
 - Continuing to obtain approvals for the calibration gas calculation (RPP-CALC-62150).
 - Continuing efforts to complete *Operational Readiness Checklist* items.

Key Performance Parameter 5

Define unrestricted work boundaries and implement monitoring on active stack ventilation and unrestricted work boundaries in the A farms to provide defense-in-depth.

Stack and Boundary Monitors

Last update 6/7/2018:

Activities in progress at the end of May include:

- Performing fabrication and factory acceptance testing of the Ultra Violet Differential Optic Absorption Spectrometry (UV-DOAS) units.
- Continuing to prepare work packages for installation of the 702AZ, AN Farm, AW Farm, and AX Farm stack monitors.
- Continuing to review AW Farm stack monitor design package.
- Starting to review the 90% design package for the AX Farm stack monitor.

Establishing Safe Unrestricted Boundaries

Last update 6/7/2018:

The *Industrial Hygiene Basis for defining the Unrestricted Work Boundary*, clarifying how WRPS will define work boundaries in and around the Tank Farms, was published on March 28, 2018. An internal review of the *Industrial Hygiene Basis for defining the Unrestricted Work Boundary* was conducted and a gap analysis performed. A revision to TFC-ESHQ-S_IH-C-48 *Managing Tank Chemical Vapors* was performed to address the gaps and incorporate necessary improvements to the process. C-48 is currently under review and comment resolution.

Public Address (PA) System

Last update 6/7/2018:

Activities at the end of May include the following:

- Continuing activities to support turnover of the second set of PA systems (AW, AN, AP and C Farms). Efforts are focused on resolving switch and filter issues.
- Continuing efforts for the next set of PA systems (B, S, T, and U Farms). Fieldwork at S, SX, and SY Farms was initiated and completed (excavation, trenching, wiring, and conduit installs) with the exception of terminating wires and resolving the same switch and filter issues that are impacting the east area PA systems. Additionally, trench excavation was begun at T Farm and the installation of the crash gates at AP Farm and AW Farm were completed.

KPP 6. Tank Operations Stewardship

Pilot SST Stewardship Program

Last update 6/7/2018:

Activities completed as the month of May came to a close include the following:

SST Remote Monitoring Equipment:

Efforts to start MSA network development and installation activities have been delayed as MSA is working contract issues with their construction subcontractor. Efforts continued on the draft 60% TX Farm design package.

FY2015 LEAN Report:

The *SST Stewardship Execution Strategy Document* was approved.

Key Performance Parameter 6

Institutionalize a tank operations stewardship program that minimizes required Tank Farm personnel entries; and establishes parameters for locating ancillary personnel and offices.

KPP 7. Hierarchy of Controls

Cartridge Testing and SCBA Alternatives

Last update 6/7/2018:

PNNL began circulating its draft report of APR testing performed in SX Farm during June 2017. The report for PAPR cartridge testing conducted at SX-101 and SX-104 was released. Recent cartridge testing data collected from the AX Exhauster has been analyzed and the report is in draft. AW Stack cartridge testing is scheduled this weekend during waste disturbing activities.

SCBA chest straps on order are arriving; inventories increasing.

APR cartridge testing for excess charcoal dust has been completed. The inventory of concern was returned to the manufacturer and replaced with fresher/newer cartridges.

Key Performance Parameter 7

Provide options to promote the hierarchy of controls for chemical vapor respiratory protection beyond current use self-contained breathing apparatus.

Mobile Laboratory

Update:

RJ Lee Mobile Laboratory: The lab is supporting the ³C₂Sense[®] data collection from the AP Stack, the AP Stack ammonia spike testing (part of the stack monitor startup), and the evaporator EC-09 campaign.

New Mobile Laboratory: TerraGraphics is in the process of designing and building a new mobile laboratory for lease by WRPS. The new mobile laboratory features enhanced capabilities, including a more sensitive PTR-MS, Ultra-Violet-Differential Optical Absorption Spectrometer (UV-DOAS), and Fourier transform infrared spectrometer (FTIR). In support of the new van, the ⁴CEREX[®] UV-DOAS/FTIR cabinet was shipped to TerraGraphics to be incorporated into the mobile laboratory. The FTIR module was subsequently returned to CEREX[®] for warranty repair on the circuit board.

Personal Vapor Monitor

Update:

The C₂Sense[®] field demonstration data collection is ongoing.

- Calibration certifications on the ⁴Ventis[™]Pro V detectors were obtained and the instrument was deployed for the field demonstration test.
- Ammonia data from four C₂Sense[®] units, four ⁵ToxiRAE Pro detectors, four ⁶Ventis[™]Pro V detectors, and two ground truth instruments was collected from the A-103 passive breather filters.
- Four ⁷GfG Micro IV ammonia detectors have been shipped from the manufacturer.

- C₂Sense® completed the first version of algorithms for their ammonia detectors that allows conversion of raw conductance signal to ammonia concentration. C₂Sense® also completed a blind comparison of the C₂Sense® ammonia detector results to the AreaRAE results. A substantial amount of the data compared very well, but there was also a substantial amount of false positive responses on the C₂Sense® detector.

KPP 8. Medical Support

The scope of KPP-8 is to support RL medical program enhancements in conjunction with other Hanford Site organizations.

Key Performance Parameter 8

Support medical program enhancements in conjunction with responsible Hanford Site organizations and establish update to WRPS process/procedures.

¹Strobic Air is a registered trademark of MPC Inc., Wilmington, Delaware.

²NUCON is a registered trademark of Nucon International, Inc., Columbus, Ohio.

³C₂Sense is a registered trademark by C2Sense, Inc., Cambridge, Massachusetts.

⁴CEREX® Stack Monitor CEREX trademark by TECAN SP, INC. Baldwin Park, California.

⁵RAE Systems by Honeywell, San Jose, California.

⁶Ventis™ Pro5 Multi-Gas Monitor is a registered trademark by Industrial Scientific in Pittsburgh, Pennsylvania.

⁷GfG Micro IV Single Gas Detector from GfG Instrumentation, Inc.