



washington **river**
protection solutions



Pictured is the new Mobile Monitoring Laboratory. To the right is pictured a dedicated computer inside the Mobile Lab. (Photo courtesy of G. Weeks.)

**Tank Operations Contract
Chemical Protection Program Office
August 9, 2018**

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

A Chemical Protection Program Office (CPPO) intern and a Contracts intern, focusing on continuing improvement, performed a review of the Hanfordvapors.com website. Their lines of inquiry centered on the website's ease of navigation, search functions, understandability, age of the information, and the usefulness of the information. The draft assessment is in technical editing.

The draft *Chemical Vapors Action Plan* (CVAP) includes Key Performance Parameters (KPPs) to monitor and measure progress and success against the plan. The CPPO is tasked with delivering on KPP 1: establishing a comprehensive vapor management communication plan, engagement processes, and effectiveness measurements. In January 2018, the CPPO conducted the first of the two required assessments with a survey of 714 members of the WRPS workforce. The results of the survey were published in May 2018 in the *2018 Workforce Vapors Information Survey*. The second assessment, a focus group, took place July 30 through August 2, 2018, with approximately five people in each of four sessions held over the course of the four days. CPPO moderated the discussions, which lasted approximately one hour each. In order to minimize the impact on fieldwork, this activity took place during high-heat days, when the workers were scheduled to be out of the field. Workers discussed the effectiveness of WRPS vapors communications, including all-employee emails, CPPO products, like the Notebook, and the external website.

CPPO Oversight and Tracking Hanford Vapors Website

Figure 1 shows that the Hanford Vapors website logged over 3,730 views in July 2018, marking a thirty percent increase from June. In July, the website experienced an average of 121 hits-per-day, which is above the average for fiscal year (FY)2018-to-date. July has had the highest website usage over the past nine months.

Website traffic was significantly elevated on July 25 even though nothing new was posted that day. Additionally, CPPO conducted an internal review of the website, which may have contributed to the increase in web page views in July.

Communications and Public Relations (C&PR) reported posting the following 21 items to the site this month:

- [CPPO Weekly Report - May 10, 2018](#)
- [CPPO Weekly Report - May 17, 2018](#)
- [CPPO Weekly Report - June 7, 2018](#)
- [CPPO Weekly Report - June 14, 2018](#)

- [CPPO Weekly Report - June 21, 2018](#)
- [CPPO Weekly Report - June 28, 2018](#)
- [CPPO FY18 3rd Quarter - July 19, 2018](#)
- [CVST Agenda - May 9, 2018](#)
- [CVST Agenda - June 13, 2018](#)
- [CVST Agenda - July 11, 2018](#)
- [EA-32 summary](#)
- [HPP new page](#)
- [Odors reported in 242-A pump storage room](#)
- [Odors reported outside of AW Farm](#)
- [PNNL-26777 – Proposed HTFOELs for Chronic Exposures – COPCs with Regulatory Guidelines, Rev. 0](#)
- [PNNL-26819 – Proposed HTFOELs for Chronic Exposures – Nitrile-Class COPCs and 2,4-Dimethylpyridine, Rev.0.](#)
- [PNNL-26820 – Hanford Tank Vapor Chemicals of Potential Concern Update for Fiscal Year 2017, Rev. 0.](#)
- [PNNL-27530, Rev. 0, The APGEMS-TF Atmospheric Dispersion Model for Tank Farms Applications](#)
- [SST Stewardship Project Execution Strategy \(RPP-RPT-60443; Rev. 0\)](#)
- [UPDATE: Odors reported outside of AW Farm](#)
- [Vapors Weekly Update – June 22](#)

Figure 1. Hanford Vapors Website Statistics July 2018



Data Access Visualization (DAV) Tool

CPPO subcontracted with Pacific Northwest National Laboratory (PNNL) to build and launch the DAV Tool early in FY2018. The DAV Tool promotes transparency by providing access to historical and current tank vapor samples, monitoring results, and visual representations of relevant data and contextual information. This sophisticated tool provides data to a 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.

Table 1 presents July 2018 DAV Tool statistics, as provided by Google Analytics.

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

| 2018 | Total Page Views | Most Popular Feature | Second Most Popular Feature | Most Popular Region | Other Regions | New Users | Returning Users | | | | | |
|--|--------------------|--|--|---------------------|---|-----------|---------------------------------|----------------|---------------|--------------|---------------------|--------------------|
| July | 355 | Chemical Selection: Chart Type: Single Chemical Area Ammonia (7664-41-7) | Explorer-Set-Filter Explorer-Set-Filter is where the user is actively filtering on Chemicals of Potential Concern (COPCs) or All Chemicals. | *Washington State | New York Arkansas Colorado Idaho Illinois Kansas Oregon Pennsylvania | 50% | 50% | | | | | |
| *July Washington State Breakdown: | | 1. Total Page Views: 328 (92%) Average Session Duration: ~2 min 2. Total Unique Users: 49 Region/Marketing: Yakima-Pasco-Richland-Kennewick: 47 Seattle-Tacoma: 2 | | | | | | | | | | |
| 3. Page views by Region Yakima-Pasco-Richland-Kennewick: 322 Seattle-Tacoma: 6 | | 4. New vs Returning Users <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Yakima-Pasco-Richland-Kennewick</td> <td style="padding: 2px;">Seattle-Tacoma</td> </tr> <tr> <td style="padding: 2px;">New Users: 36</td> <td style="padding: 2px;">New Users: 2</td> </tr> <tr> <td style="padding: 2px;">Returning Users: 11</td> <td style="padding: 2px;">Returning Users: 0</td> </tr> </table> 75% of referred traffic is coming from: hanfordvapors.com | | | | | Yakima-Pasco-Richland-Kennewick | Seattle-Tacoma | New Users: 36 | New Users: 2 | Returning Users: 11 | Returning Users: 0 |
| Yakima-Pasco-Richland-Kennewick | Seattle-Tacoma | | | | | | | | | | | |
| New Users: 36 | New Users: 2 | | | | | | | | | | | |
| Returning Users: 11 | Returning Users: 0 | | | | | | | | | | | |

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Engagement and Effective Measurement

CTEH

Update:

Dr. Mike Lumpkin and Dr. Pamella Tijerina were the CTEH-toxicologists onsite last week. The doctors met with chemistry and Industrial Hygiene (IH) Subject Matter Experts (SMEs) to develop three CPPO Notebooks.

On Wednesday, Dr. Pamella Tijerina and Dr. Mike Lumpkin met with a group of approximately twenty tank farm workers and Hanford firefighters who had recently completed the Chemical Worker Tier III training. The toxicologists spoke to the group about CTEH's mission at Hanford, and answered toxicology and health-risk-related questions. Specific questions included:

1. If tank vapors exiting the passive breather filters are diluted up to 98% at 1 meter from the filter, what is the minimal dilution at 1 meter?
2. Do the tank wastes boil and bubble?
3. What health-related questions are CTEH toxicologists typically asked?

The questions were answered. CPPO keeps a record of any questions that cannot be answered in person and forwards the questions to subject matter experts, who develop an answer.

Dan Christenson, a CTEH Industrial Hygienist, was also onsite last week to help moderate four CPPO focus group sessions where tank farm workers were asked about the accessibility and clarity of various vapors communications. Individual responses are confidential.

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, *Leading Indicators for Monitoring Tank Vapors: Phase 2*. CPPO provided information to C&PR on leading indicators for an upcoming article in *Solutions*.

Chemical Protection Engagement: Chemical Vapors Solutions Team (CVST)

The CVST Chemical Cartridge CVST Sub-Team held a meeting on August 1, 2018.

[Chemical Protection Engagement: Hanford Vapors](#)

[Website Updates](#)

[CPPO Weekly Report 07262018](#)

[PNNL-27449 Leading Indicators Phase2 Final FY18 Report](#)

[Chemical Protection Engagement: Workforce Engagement](#)

Last update 8/2/2018:

The CPPO has decided to suspend site briefings for the remainder of FY2018 to allow the workforce to focus on completing end-of-the-year commitments. The plan is to re-start the vapors-related workforce site briefings at the beginning of FY2019.

Key Performance Parameter 2

Maintain Industrial Hygiene Chemical Vapor Technical Basis and the chemicals of potential concern (COPC). Institutionalize a disciplined and rigorous process for updates to include new scientific findings and enhanced understandings of potential exposures.

KPPs 2 and 3. IH Technical Basis and IH Program

[IH Manual and Technical Basis](#)

Last update 8/2/2018:

Since the beginning of the 4th Quarter, the TOC-IH-58435, *Industrial Hygiene Manual*'s updated sections expanded to include Section 5, *Reporting Occupational Exposure, and Medical Monitoring*, which is now on the Industrial Hygiene webpage on the Intranet. Section 6 is renamed and repurposed and is now titled *Work Control*. It is in draft review with DOE ORP. Section 7, *IH Program Administration*, is drafted, and is in internal WRPS review. Section 8, *Documents and Records*, is also in draft and in internal WRPS review. TFC-PLN-173, *Use of FFAPR in Actively Ventilated Tank Farms*, is posted on the website for implementation in SY and AP Farms. It is being edited to include AN Farm.

The Industrial Hygiene organization is reporting 100% of the IH workforce has been trained in *Risk Communication Techniques* and ~100% trained in *Crucial Conversations*.

[Health Process Plan \(HPP\)](#)

Last update 8/2/2018:

The following HPP studies conducted by PNNL have been released as final versions under the TFC-Charter-71 process: *Proposed OELs for Chronic Exposures – COPCs with Regulatory Guidelines, Hanford Tank Vapors FY 2017 Chemicals of Potential Concern Update*, and *Proposed OELs for Chronic Exposures – Nitrile Class COPCs and 2,4-Dimethylpyridine, Proposed Acute Exposure Limits for COPCs with Regulatory Guidelines and Recommendations for Sampling and Analysis of Hanford Waste Tank*

Vapors. Two studies are in internal review by PNNL prior to release as final versions: *Proposed Acute Exposure Limits for COPCs with Regulatory Guidelines* and *Recommendations for Sampling and Analysis of Hanford Waste Tank Vapors*. Two studies are currently being reviewed by IH for technical and economic impact per the Charter 71 process. They are *Proposed Risk-Based Approach for Nitrosamine Chemical of Potential Concern* and *Proposed Occupational Exposure Limits for Furans*. One study is in internal review by PNNL prior to release as final version: *Sampling and Analysis Recommendations*.

Air Dispersion Modeling

Last update 8/2/2018:

The Air Pollutant Graphical Environmental Monitoring System (APGEMS) modeling software (version 1.0) and accompanying report were released in May. The report describes the APGEMS-TF software and presented three test cases illustrating model performance for simulations involving the AP, AW, and AN Stacks, as well as the 242-A Evaporator. The test cases were selected to provide model predictions of ammonia and mercury air emissions during low, medium, or high wind conditions. The APGEMS-TF software was refined and version 1.1 was delivered to WRPS for acceptance testing. WRPS Engineering and IH are evaluating the software and providing feedback to the PNNL team. Representatives from Process Engineering and CTO Fugitive Emissions team were trained in the use of APGEMS-TF Version 1.1 last week.

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.

Central Residence for Industrial Hygiene Technicians (IHT)

Update:

As of last week, five of the ten 10-Wide trailer sections had been delivered to the 200 East area on 4th Street near 218A across from PUREX. The 10-Wide trailer foundation and tie-down construction is complete. The new trailer's furniture for occupancy has been received and is in the warehouse for delivery when the trailer assembly is completed.

The trailer sections began arriving for installation on July 31, 2018. Each section is set and securely tied down as it arrives. All ten sections are scheduled to arrive and to be secured early next week. The vendor will begin the process of marrying up the seams at the walls first, followed by the roof and ceiling.

Figure 2. (Right)
The new formwork testifies to the steady progress towards installing the 10-Wide trailer. (Photo courtesy of C. Holst, July 2018.)



Figure 3. (Left) R. Campbell sent the first photo of the first four trailers. August 2018.



Figure 4. The 10 Wide in Progress. (Photo courtesy of D. Merrill, August 2018.)

KPP 4. Engineering Controls

A Farm Exhausters

Last update: 7/26/2018:

Exhausters: Over the last two weeks, crews assembled and completed the exhauster slab concrete forms in the A Farm. Additionally, the team began setting rebar for the foundation.

A/AX Farm Road Expansion: The team continued establishing crossing plates so that support cranes can access the area.

Procurement/Fabrication: A material request was completed for the POR518/POR519 exhauster valve manifold, the manifold support, the access platform, ventilation ducting, riser assemblies, duct stand assemblies, and concrete blocks.

Key Performance Parameter 4

Complete engineering control concept demonstrations for Strobic Air Tri-Stack^{®1} and NUCON^{®2} International, Inc. thermal combustion in support of unrestricted work boundaries.

AW Stack Extension

Last update 7/26/2018:

Over the last two weeks, the preparation for 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 the Office of River Protection (ORP) for review, and the non-radiological permit is with Washington State Department of Ecology for review.
- The stack foundation fabrication and preparation for installation activities continued. The site foundation has been completed.

AN Stack Extension

Update:

Design Engineering has a draft stack extension evaluation under review. The current infrastructure may be able to support an 18-foot extension to the stack.

1Strobic^{®3} Air Dilution Fan

Last update 7/26/2018:

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

- Testing, initiated in the 3rd Quarter, was completed in this quarter.
- Efforts started on evaluating the test results and data.

2NUCON® Thermal Oxidation Vapor Abatement Unit (VAU)

Last update 7/26/2018:

Since the beginning of July, the following was accomplished:

TerraGraphics:

- Work continued on the *Technical Demonstration Conceptual Design* for BY-108, including providing a briefing on the 90% conceptual design to the NUCON Integrated Project Team. The design package was submitted for review.

NUCON®:

Phone consultations were provided to WRPS and PNNL.

WRPS:

- WRPS worked with the 222-S Lab and third party analytical labs to determine a path forward for solving analytical challenges with N-Nitrosodimethylamine (NDMA) encountered during the engineering-scale test.
- Provided final comments on the draft *Quick Look Report*.
- Prepared documentation to procure the PNNL portion of the FY2019 NUCON® scope.

PNNL:

PNNL is evaluating test results and preparing the draft test report, as well as incorporating WRPS's comments into the draft test report.

KPP 5. Administrative Controls and Monitoring

Permanent Installation of VMDS Equipment in AP Farm

Last update 8/2/2018:

In FY2017, WRPS identified viable VMDS components for use in the Tank Farms, and the turnover of AP Farm ultra-violet Fourier transform infra-red (UV-FTIR) spectrometer to Operations was initiated. Turnover activities continue, including the following:

- Approval of the uncertainty evaluation (RPP-RPT-60669).
- Completing the Operational Acceptance Tests (OAT) needed to support turnover. The OAT was split into three separate OATs to optimize the approval process. The first OAT addresses interim reliability of the system to support startup testing. The second OAT addresses startup activities

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.

where no gas testing is required. The third OAT addresses startup activities where gas testing is required. A status for each OAT is provided below:

- Interim Reliability OAT: The OAT was reviewed by the Joint Test Group and Joint Test Working Group committee and their comments are currently being resolved.
- No-Gas Testing OAT: The draft OAT has been prepared and is awaiting a Joint Test Working Group review.
- Gas Testing OAT: The draft OAT is currently being prepared.
- Efforts also continued on installing the bottle rack, troubleshooting the new flowmeter to resolve leak issues, procuring a vendor for calibration support, and receiving equipment (calibration gases, permeation tubes).

Stack and Boundary Monitors

Last update 8/02/2018:

In addition to the turnover of the AP Farm UV-FTIR stack monitor to Operations discussed above, other stack and boundary monitoring activities are planned. The work scope includes installing stack monitors on the AW, AX (two), AN, and 702-AZ Exhausters. Activities since the beginning of July include the following:

- Fabrication and factory acceptance testing of the Ultra Violet Differential Optic Absorption Spectrometry (UV-DOAS) units. WRPS sent representatives to the subcontractor's facility to support testing activities.
- Site preparation work for installation of the 702AZ and AN-Farm stack monitors.
- Approval and release of the AW Farm stack monitor design package, and preparation of the draft work package for field installation, which is currently under review.
- Approval and release the AX Farm stack monitor design package, and preparation of the draft work package for field installation.

Establishing Safe Unrestricted Boundaries

Last update 8/2/2018:

Signs have been prepared to identify the Industrial Area, Exclusion Zone, and Contamination Reduction Zone. Signs will not be prepared to identify the Support/Administrative Zone or Site Boundary. Meetings have been held with other site representatives informing them of the pending changes to farm signage.

Public Address (PA) System

Last update 8/02/2018:

Activities performed in the last couple of weeks include the following:

- Continued the many activities required to support the turnover of the second set of public address (PA) systems (AW, AN, AP and C Farms). Efforts are focused on resolving switch and filter issues.
- Continued efforts for the next set of PA systems (B, S, T and U-Farms). Fieldwork at T and U Farm complexes was completed (excavation, trenching, wiring, and conduit installs). The excavation and conduit installations were completed at B-Farm and wire termination was started.

KPP 6. Tank Operations Stewardship

Pilot SST Stewardship Program

Last update 8/02/2018:

During the 3rd Quarter, the SST Stewardship Program's scope and schedule were reviewed. It was determined that the TY Farm installation activities would be deferred until FY2019, while the TX Farm and TY Farm designs, along with the *SST Stewardship Execution Strategy Document (FY 2015 LEAN Report)*, would still be completed in FY2018. Activities in the 3rd Quarter of FY2018 included the following:

SST Remote Monitoring Equipment:

The TY Farm temperature and surface level design packages were completed and the contract for the TX Farm design package was awarded. The draft 60% TX Farm package has been completed and reviewed, and the comments are being incorporated. In addition to the design packages, Mission Support Alliance (MSA) started working with their construction subcontractor to support network and installation activities.

FY2015 LEAN Report:

RPP-RPT-60443, the *SST Stewardship Execution Strategy Document*, was approved in the 3rd Quarter.

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 8/2/2018:

IH attended meetings with the WRPS management to discuss the status of SCBA alternatives. Cartridge testing has been completed for FY2018, and the SX-101 and SX-104 APR and PAPR reports have been issued. The BY sampling data is being analyzed by PNNL. The headspace comparison/line-loss project data is being analyzed as well.

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:

TerraGraphics (TG) has designed and built a new mobile laboratory that WRPS will lease. The new mobile laboratory features enhanced capabilities, including a more sensitive proton transfer reaction-mass spectrometry (PTR-MS), ultraviolet differential optical absorption spectrometer (UV-DOAS), fourier transform infrared spectrometer (FTIR), flame ionizing detector, photo-ionizing detector, and a Picarro ammonia analyzer. Since the beginning of July, TG has focused on resolving FTIR procurement issues and confirming procedures for equipment testing and validation. The TG mobile laboratory made its inaugural trip to the tank farms early last week and performed area monitoring at the corner of 4th and Buffalo. The new mobile laboratory's first two activities will be: 1) monitoring to support AP Stack ammonia spike testing; and 2) sampling and diluting the AP Stack gas in support of personal ammonia detector testing.

Personal Vapor Monitor

Update:

Due to limited Radiological Control Technician (RCT) and Industrial Hygiene Technician (IHT) support for the remainder of FY2018, IH management decided to stop Phase II C₂Sense®⁴ testing with the mobile laboratory and proceed directly to report preparation. Phase III of C₂Sense® testing, to collect zero ammonia background data for instrument sensitivity calculations, was initiated. One of two planned weeks of data collection has been completed. Phase III of C₂Sense® testing does not require RCT or IHT support. Data analysis and report preparation for Phase I and Phase III of testing is underway.

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 Tri-Stack is a registered trademark of Strobic Air Corporation, Bensalem, Pennsylvania.

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

³Strobic is a registered trademark of MPC Inc., Wilmington, Delaware.

⁴C₂Sense is a registered trademark by C2Sense, Inc., Cambridge, Massachusetts.