



washington **river**
protection solutions



Pictured are the ten trailer sections that will form the Central Residence for Industrial Hygiene Technicians.

(Photo courtesy of R. A. Campbell.)



Tank Operations Contract
Chemical Protection Program Office
August 23, 2018

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

The Chemical Protection Program Office began the process of updating the metrics behind the CVAP Dashboard for Fiscal Year (FY) 2019. Work continues on the evaluation of the status of external assessment recommendations, with the bulk of the effort anticipated to conclude in FY2018.

Report development is underway on the evaluation of the HanfordVapors.com website by the CPPO and Contracts interns, who performed a review of the Hanfordvapors.com website. Their findings about the website's ease of navigation, understandability, age of the information, and the usefulness of the information have been compiled into a draft assessment, which is currently in technical editing.

A report has also been drafted on the CPPO-led focus group sessions, where Tank Farm Workers were asked to evaluate the effectiveness of vapors information. The final report will include observations and recommendations for improving the effectiveness of vapors information, and is anticipated to be distributed before the end of FY2018.

CPPO Oversight and Tracking

No Metric This Week

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Engagement and Effective Measurement

CTEH

Update:

CTEH toxicologists interacted with various WRPS Subject Matter Experts (SMEs) and worker groups to develop and convey risk communication pieces designed to address workers' health risk concerns. Several topics were discussed while meeting with the Hanford Atomic Metal Trade Council (HAMTC) safety leads. The toxicologists also held a 45-minute question and answer session with about 20 tank farm workers attending the Chemical Worker Tier 3 training. Several CPPO Notebooks were finished and others were developed with Industrial Hygiene (IH) SMEs. The Notebooks answer questions workers have raised regarding respirator cartridge filter principles and the ability of onsite lab methods to identify headspace chemicals. Work continued on CTEH's re-assessment of the IH program's approach

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

to managing tank vapor issues. This re-assessment will be finalized by the end of the fiscal year.

Chemical Protection Engagement: Communications

Update:

On August 16, 2018, the CPPO released the Notebook entitled, *242-A Evaporator Campaign-06*. This Notebook updates a Notebook with the same title, released August 31, 2017, and contains additional data results. The prior week's Notebook entitled, *Air Dispersion Modeling Project: APGEMS-TF*, was presented at the Monday morning Safety Startup.

The following three Shift Office Event Notifications (SOEN) were released during the week of August 13 through 16, 2018:

- On August 13, 2018, a SOEN was issued announcing the West area Public Address (PA) system testing.
- On August 14, 2018, a SOEN was issued to announce restricted access to the Middle-C Farm Change Tent because strong herbicide odors were reported.
- Again on August 16, 2018, a SOEN was issued restricting access to the Middle-C Farm due to strong herbicide odors. Access was restored soon after the SOEN was issued.

The 448th Issue of *Solutions*, which was released August 13, 2018, contained an article summarizing the CPPO Notebook on leading indicators that was released on August 2, 2018.

The August 2018 Industrial Hygiene Newsletter featured a write-up on ToxiRAE¹ Monitors, which are direct-read instruments for ammonia exposure that will be onsite and in use at the Hanford Tank Farms within the next few weeks.

A HAMTC/CPPO interface meeting was held on August 15, 2018. The meeting was attended by two members from CPPO, two CTEH toxicologists, three HAMTC safety representatives, and an employee from Sampling Operations. The CTEH toxicologists answered various questions related to vapors at the Tank Farms. The HAMTC safety representatives and the Sampling Operations employee suggested topics for future CPPO Notebooks.

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

Update:

The CVST Communications Sub-Committee meeting was held on August 13, 2018. Communications, Management, Operations, HAMTC Safety Representatives, Nuclear Chemical Operators, Radiological Control Technicians and CPPO were in attendance. The Communications Manager lead the meeting with an agenda of various topics open for discussion. Among these, the Communications Manager gave an update on the litigation and settlement discussions, the Worker Incentive Plan, the AN Farm full-face, air purifying respirator (FFAPR) status, as well as an open table discussion on actions or concerns from the previous meeting. The 222-S representative provided an update regarding the 222-S equipment fire that occurred the week prior. An instrument had caught on fire. Two members of 222-S laboratories responded quickly and according to protocol, extinguishing the fire. Subsequently, both members were taken to the hospital to be checked for smoke irritation. A question was asked about the CPPO Notebook on Leading Indicators. A CPPO Subject Matter Expert was in attendance and was able to answer the question, as well as provide clarification to the specifics of the Pacific Northwest National Laboratory (PNNL) Leading Indicators Report upon which the Notebook was based. The next CVST Communications Sub-Committee is scheduled August 27, 2018.

A CVST Sub-Committee Cartridge meeting was held August 15, 2018.

The CVAP Field Execution Schedule (FES) meeting, scheduled August 15, 2018, was cancelled.

✚ Chemical Protection Engagement: Hanford Vapors Website Updates

- [PNNL-26850 - Proposed Acute Exposure Concentration Limits for COPCs with Regulatory Guidelines](#)
- [PNNL-26850 – 2018, Proposed Acute Exposure Concentration Limits for COPCs with Regulatory Guidelines, Rev. 0 Summary](#)
- Additions to this page: <https://hanfordvapors.com/what-is-hanford/222-s-laboratory/>

✚ 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 tentative plan is to restart the vapors-related workforce site briefings at the beginning of FY2019.

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 Department of Energy (DOE) Office of River Protection (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.

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.

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 tests 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 Chief Technology Office (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, all ten of the trailer sections for the 10-wide were delivered to the 200 East area on 4th Street near 218A across from PUREX. Significant progress has been made in connecting the ten sections to form one large building. (See the photos on the cover sheet.)

KPP 4. Engineering Controls

A Farm Exhausters

Update:

Exhausters: The rebar foundation for the exhauster slab is installed (**Figure 1**) and the concrete has been poured on east half of the slab (**Figure 2**).

Procurement/Fabrication: Continued procurement of the POR518/POR519 exhauster valve manifold, manifold support and 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^{®2} and NUCON^{®3} International, Inc. thermal combustion in support of unrestricted work boundaries.



Figure 1. Installing Rebar and Pouring Concrete for A-Farm Exhauster Slab. (Photo courtesy of M. Allen)



Figure 2. Completed Concrete Pour for east side of A-Farm Exhauster Slab (Photo courtesy of M. Allen)

AW Stack Extension

Update:

The installation of the AW-Farm stack extension continued with the following being accomplished during the reporting period:

- Efforts continued on preparing the non-radiological and radiological permit applications. The radiological permit is with ORP for review while comments from Ecology on the non-radiological permit are being incorporated.
- Efforts continued on stack installation and fabrication activities. Development of the installation work package is dependent on completion of the draft lift plan, which is currently being routed for approvals. Fabrication of the stack extension continues.

AN Stack Extension

Update

During the reporting period, preliminary Design Engineering reviews indicated that the proposed foundation could support extending the stack from 27 feet to 45 feet.

Strobic^{®4} Air Dilution Fan

Update

Efforts continued on evaluating the test results and data from the recently completed off-site testing of the unit. Some of the test parameters may be re-evaluated to confirm data conclusions.

NUCON[®] Thermal Oxidation Vapor Abatement Unit (VAU)

Update:

Terragraphics

- Terragraphics received comments and began comment-resolution on the 90% Conceptual Design of the NUCON[®] infrastructure for the field demonstration on BY-108.

NUCON[®]

- NUCON[®] continued to provide telephone consulting.

PNNL

- PNNL completed the draft A test report entitled, *NUCON Vapor Abatement Unit Performance on Hanford Tank Farm Chemical of Potential Concern*, which captures the test results from the NUCON[®] engineering-scale test.
- PNNL presented a summary of the NUCON[®] test report draft to the NUCON[®] integrated project team.

WRPS

- WRPS reached agreement on contracting strategy for the NUCON® final design.
- WRPS reviewed and provided comments on the 90% Conceptual Design for the BY-108 field demonstration.
- WRPS completed its review of the draft report entitled, *NUCON® Vapor Abatement Unit Performance on Hanford Tank Farm Chemical of Potential Concern*, which summarizes data results from the NUCON® engineering-scale test.

KPP 5. Administrative Controls and Monitoring

Permanent Installation of VMDS Equipment in AP Farm

Last update 8/16/2018

- Efforts to obtain approvals on the Phase 2 Pilot-Scale Report continue.
- For the AP-Farm ultra-violet fourier transform infrared spectrometer (UV-FTIR) turnover, numerous activities were on-going during the reporting period, including the following:
 - The Operational Acceptance Tests (OATs) needed to support turnover were completed. 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 where no gas testing is required; and the third OAT addresses startup activities where gas testing is required. A status of each OAT is provided below:
 - Interim Reliability OAT: Comments from the Joint Test Group and Joint Test Working Group committee were resolved, and the OAT was released for use.
 - No-Gas Testing OAT: The draft OAT has been prepared and is awaiting a Joint Test Working Group review.
 - Gas Testing OAT: This OAT will be started after the Interim Reliability and No-Gas OATs are completed.
 - A contract was awarded to a calibration contractor, who will support testing activities.
 - Efforts also continued on installing the bottle rack and procuring permeation tubes.

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 8/16/2018:

- The ultraviolet differential optical absorption spectrometer (UV-DOAS) unit for AZ-Farm was delivered on-site, and efforts to fabricate and factory-acceptance test the UV-DOAS unit for AN-Farm continued.
- Site preparatory work for the 702AZ stack was completed, and installation of the UV-DOAS monitor began.
- Site preparation work for the installation of the AN-Farm stack monitor continues.
- The work package for installation of the AW-Farm UV-FTIR stack monitor was released, and site preparation was started.
- The draft work package for installation of the AX-Farm stack monitor was completed and is currently under review.

+ 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 at this time. Meetings have been held with other site representatives informing them of the pending changes to farm signage.

+ Public Address (PA) System

Last update 8/16/2018:

- Activities supporting the turnover of the second set of public address (PA) systems (AW, AN, AP and C-farms) continue.
- Efforts for the next set of PA systems (B, S, T and U-Farms) continue. The excavation, trenching, wiring, and conduit installations for S, T and U-Farm complexes were completed and are ready for functional testing, while wire installation activities at B-Farm continue.

KPP 6. Tank Operations Stewardship

+ Pilot SST Stewardship Program

Last update 8/16/2018:

Remote Monitoring Equipment: Efforts on the final design package commenced with a number of the support calculations getting approved. In addition to the design package, Mission Support Alliance has started laying fiber in support of network development activities.

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 WRPS management to discuss the status of self-contained breathing apparatus (SCBA) alternatives. Cartridge testing has been completed for FY2018, and the SX-101 and SX-104 APR and powered air purifying respirator (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

Updated:

- TerraGraphics completed design and construction of a new mobile laboratory that WRPS is leasing. The new mobile laboratory's capabilities will be enhanced as compared to their predecessor's mobile laboratory. For instance, TerraGraphics's mobile laboratory will have a more sensitive Proton Transfer Mass Spectrometer (PTR-MS) (Iconon TOF-6000), UV-DOAS, fourier transform infrared spectrometer (FTIR), flame ionization detector (FID), and photo ionization detector (PID).
- The Factory Acceptance Testing of the new mobile laboratory was successfully completed.
- OAT was performed the last week of July by sampling at 4th and Buffalo.
- Mobile area sampling was performed across the Hanford site.
- The mobile laboratory provided support to the fugitive emissions initiative by sampling the following locations:
 - Around the septic tanks located near the 242-A evaporator;
 - Downwind of the septic tanks, near 244-AR; and
 - In the vicinity of a local onion producer.

+ Personal Vapor Monitor

Updated:

Phase III testing of the following personal vapor monitoring devices was completed: C₂Sense^{®5}, ToxiRAE Pro, Ventis™Pro V⁶, and the 7GfG Micro IV⁷ detectors. Phase III testing collected background data for instrument sensitivity calculations. Data analysis for Phase III testing was completed for all monitoring devices except the C₂Sense[®]. A draft report for the personal vapor monitoring device testing is being prepared as data analysis of Phases I and III of testing

reaches completion. C₂Sense® submitted an interim draft report covering data analysis and development of an alpha version of the device algorithm. While the algorithm has improved, false positives in the data reveal that more work is required. C₂Sense® is continuing to enhance the algorithm, and a new revision of the report is expected before the end of FY2018.

Due to limited Radiological Control Technicians (RCTs) and Industrial Hygiene Technicians (IHTs) support for the remainder of FY2018, IH management decided to stop Phase II C₂Sense testing with the mobile laboratory and proceed directly to report preparation.

KPP 8. Medical Support

The scope of KPP-8 is to support RL medical program enhancements in conjunction with other Hanford Site organizations. **The last update from HPMC was April 12, 2018, for the 2nd Quarter.**

During the 2nd Quarter:

- The Office of the Ombudsman visit was cancelled. No new visit has been confirmed.
- Discussions continue between the HAMTC President and committee related to revising the Access Control Entry System (ACES) exclusion note in the TFC-BSM-HR_EM-C-10, Reasonable Accommodations procedure. No agreement has been reached as of the date of this publication.
- HPMC confirmed that they are currently working on the epidemiology study comparing Tank Farm Vapor Exposures and Non-Exposed Group of Hanford Workers.

Key Performance Parameter 8

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

¹ RAE Systems by Honeywell, San Jose, California.

² Strobic Air Tri Stack is a registered trademark of Strobic Air Corporation, Bensalem, Pennsylvania.

³ NUCON is a registered trademark of Nucon International, Inc., Columbus, Ohio.

⁴ Strobic is a registered trademark of MPC Inc., Wilmington, Delaware.

⁵ C₂Sense is a registered trademark by C₂Sense, Inc., Cambridge, Massachusetts.

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

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