



washington **river**
protection solutions



Rees Harrison, Nuclear Chemical Operator on the Tank Farm Projects Field Crew Team, demonstrated the use of the Scott ACSi Soft Pack SCBA Unit during the Chemical Vapors Solution Team Meeting. (Photo courtesy of C&PR)

Tank Operations Contract
Chemical **Protection Program** Office Weekly Report
November 2, 2017

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

The CPPO finalized the draft Comprehensive Vapors Actions status dashboard update process. A revised dashboard reflecting fiscal year 2018 scope has been drafted. The dashboard is designed to monitor the progress of the draft Comprehensive Vapors Action Plan (CVAP) Key Performance Parameters (KPP) 1 thru 7. The Dashboard is updated monthly.

The CPPO continues to support EA-32 by gathering documents as requested.

CPPO continues to collect and deposit vapors communications into the CPPO Library and IDMS.

CPPO Oversight and Tracking **Hanford Vapors Website**

The Hanford Vapors website logged nearly 4,200 views in October 2017; slightly less than the monthly average experienced during FY17, but a 21% increase from the previous month. In October, the website experienced an average of 135 hits per day.

Odors reported outside of TX Farm drove the greatest number of hits this month. A rise in traffic continues to occur on the days that the Hanford Vapors Weekly Update is posted, with carryover views logged on the days immediately following the updates. Increased access to the Archives page also contributed to higher traffic this month.



Figure 1. Hanford Vapors Website Statistics

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Engagement and Effective Measurement

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

The CTEH team members continue developing CPPO Notebook presentations covering chemicals such as nitrous oxide, mercury, and ammonia, as well as topics like OEL development, and IH program fundamentals. A CTEH toxicologist toured areas of 200 East and 200 West with HAMTC members last week, including the Buffalo Avenue corridor, and discussed historical knowledge of waste cribs and ditches, septic fields, unplanned waste release events, and episodes of tank waste vapor exposures. CTEH continued networking with more worker groups to schedule face-to-face discussion of vapor-related health risks and answer health-related questions. CTEH met with Dr. Sandy Rock of HPMC to continue discussion of ways to bring toxicological information to risk messaging provided to workers who visit the HPMC clinic following vapor exposures.

Key Performance Parameter 1

Establish a comprehensive vapor management communication plan, engagement processes, and effectiveness measurements.

Chemical Protection Engagement: Communications

The full Chemical Vapors Solutions Team (CVST) meeting was held on October 25, 2017. Mr. Rob Cantwell reviewed several topics of interest including mediation, the EA-32 visit, an SCBA to APR rollout, and questions from the audience. [Here](#) are the CVST Meeting Minutes which are posted on HanfordVapors.com. Of particular interest, was Mr. Bobby Nelson's presentation on the SCBA Equipment Evaluation Team's (SEET) market research on available SCBAs. Mr. Rees Harrison models one of the SCBAs on the [Cover](#). The presentation is on the CVST Portal.

After the CVST meeting, the Tank Vapor Representatives (TVR) met for an hour-long conversation focused on their roles and responsibilities. The CPPO facilitated the conversation, and in addition to Mr. Joel Hebdon, CVST Chairman, and Mr. Don King, CVST Co-Chairman, several people representing the Department of Energy (DOE) Office of River Protection (ORP), Vapor Management Expert Panel (VMEP), and WRPS ESH&Q were present.

An October 26, 2017, all employee email notified the WRPS workforce that the Office of Enterprise Assessments (EA) follow-up assessment of the Hanford Tank Farms vapor issues will resume on October 30. "During this period, the EA team will conduct document reviews, observations, interviews, and focus groups."

Hanford Tank Vapors, published on October 26, 2017, discussed the strengths and opportunities identified during the Safety Culture Work Environment survey conducted in July 2017.

The CPPO Notebook published last week is titled *IH and Occupational Exposure Limits (OELs), Part I: Industry*. This week's CPPO Notebook is titled *Where to find status on progress against external assessment recommendations*.

Hanford Vapors Website Updates

- [Vapors weekly update Oct. 26, 2017](#)
- [CPPO Weekly Report - Oct. 26, 2017](#)
- [CVST Agenda - Oct. 25, 2017](#)
- [CVST Meeting Minutes - Oct. 25, 2017](#)
- [CVST Meeting Minutes - Oct. 11, 2017](#)

3. KPPs 2 and 3. IH Technical Basis and IH Program

Develop New or Revised Chemicals of Potential Concern (COPC)/Occupational Exposure Limit (OEL)

Last update 10/19/2017: WRPS completed the update of RPP-22491, *Industrial Hygiene Chemical Technical Basis*, and developed institutionalizing documents that provide a disciplined and rigorous process to periodically review IH data to identify new or changing information regarding tank vapors. The new information is analyzed in light of current scientific and regulatory information to determine if a new chemical of potential concern (COPC) should be identified. This analytical process determines if a regulatory Occupational Exposure Limit (OEL) exists for the newly identified COPC. Furthermore, the process determines when a new Hanford Tank Farm OEL (HTFOEL) should be created. New documents and procedures developed during FY2017 to maintain and institutionalize the technical basis include:

- TFC-PLN-174, *Chemical Vapors Technical Basis Plan* (New)
- TFC-ESHQ-S_IH-C-67, *IH Chemical Vapor Technical Basis Maintenance* (New)
- TFC-ESHQ-S_IH-C-66, *COPC to COC Evaluation Process* (New)

WRPS and its subcontractors completed a Chemical Vapors Requirements Flow Down and GAP Analysis (GAP). Based on the GAP analysis, WRPS developed an IH

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.

Manual and developed or revised documents and procedures to institutionalize the chemical vapors aspects of the IH program. The IH Manual (with specific focus given to institutionalizing the Chemical Vapors elements), and the seventeen revised/new implementing documents and procedures, are routing for approval through the WRAP process. These changes will be fully implemented in FY2018.

Health Process Plan

Last update 10/26/2017: Scheduled for review by WRPS's Internal Review Panel and External Expert Panel are the following drafted studies by Pacific Northwest National Laboratory (PNNL):

- *Proposed HTFOELs for Chronic Exposures – COPCs with Regulatory Guidelines*
- *Proposed Occupational Exposure Limits for Furans*
- *Proposed Risk-Based Approach for Nitrosamine Chemical of Potential Concern*
- *Proposed Acute Exposure Concentration Limits for COPCs with Regulatory Guidelines*
- *Proposed HTFOELs for Chronic Exposures - Nitrile Class COPCs and 2,4-Dimethylpyridine*
- *Assessing the Potential for Chronic or Acute Health Effects from Exposure to COPC Mixtures*
- *Recommendations for Sampling and Analysis of Hanford Waste Tank Vapors*
- *Hanford Tank Vapors FY 2017 Chemicals of Potential Concern Update*

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.

Parity Implementation with Established Programs

Last update 10/19/2017: WRPS made strides in improving parity with other well established programs such as the radiological controls program. WRPS Industrial Hygiene Programs implemented the Enhanced Chemical Hazard Awareness Training (CHAT) developed in 2016, and completed a training evaluation report to capture recommendations from students on improvement. Chemical Worker Tier 1 training is complete. As planned, it is now part of the Tank Operations Contractor Hanford General Education Training program, and available to take immediately. Chemical Worker Tier 2 was turned over to a subcontractor to code for computer based training. Mission Support Alliance (MSA) is planning on rolling out the new computer based training in October, 2017. Chemical Worker Tier 3 training was successfully piloted October 4, 2017. Comments from the pilot class will be incorporated into the lesson plan prior to final approval. The plan is to discontinue enhanced CHAT once the Tier 3 training is in service.

✦ Central Residence for Industrial Hygiene Technicians (IHT)

Introduction: Retrieval Industrial Hygiene Technicians (IHT) and their first line supervisors will be relocated to a centralized mobile office (MO) building in February/March of FY2018. The MO is slated to house approximately 100 workers. According to retrieval field support, this new space will be large enough to house all retrieval IHTs and their first line supervisors. Plans are to install the MO in 200 East area near the vicinity of Baltimore Avenue and 4th street. The installed and occupied MO will satisfy KPP 3 for retrieval IHTs. KPP 3 advocates a central location for IHTs that is commensurate with other technician level employees.

KPP 4. Engineering Controls

✦ Exhausters

Last update 10/26/2017: A Farm: The A Farm Project team met and decided upon a new location for the A-Farm Exhauster pad. This decision, following preparation and analysis of an optimization study, will permit the engineering design company (ARES) to relocate the exhauster pad. Tentatively, the design is scheduled to be completed in late 2017/early 2018.

✦ AW Stack Extension

Last update 10/12/2017: Efforts to complete the AW Stack Extension design package by early 2018 are on-track. The 60% design package continues and is currently scheduled to begin review in November.

✦ Strobic Air Dilution Fan

Last update 10/26/2017: After Strobic completes its factory acceptance testing at the Strobic facility, the unit will be shipped to Hanford for a field test late in the second quarter of FY2018. A test plan will be needed to support the field test, and last week a statement-of-work (SOW) was started to procure the resources needed to prepare the test plan.

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

+ NUCON Thermal Oxidation Vapor Abatement Unit (VAU)

Update: Bench-scale testing continues to be developed. The following was accomplished last week:

WRPS:

- Worked to get FY2018 contracts in place with NUCON, PNNL, and TerraGraphics.
- Continued preparing the technology maturation plan for the NUCON VAU.

NUCON:

- Waited for contract authorization to begin the diesel design.

PNNL:

- Obtained quote for test gases needed to support bench-scale testing, which is reflected in the current proposal. The gas-mixture intends to simulate the key COPCs encountered in the tank headspace.
- Waited for approval of FY2018 contracts to proceed on the following bench-scale activities:
 - Injection and sampling system designs
 - Instrument readiness activities
 - Test plan development

TerraGraphics:

- Received quotes from Mid-Columbia Engineering and American Electric for the fabrication of the electrical rack.

KPP 5. Administrative Controls and Monitoring

+ Permanent Installation of Vapor Monitoring and Detection System (VMDS) Equipment in A and AP Farms

Update: Numerous activities were performed throughout the week, including the following:

- Continued resolving comments on the Phase 2 Pilot-Scale Report.
- The Ultra-Violet Fourier transform infrared spectroscopy (UV-FTIR), currently installed at AP Farm, is going to be turned over to operations. The in-house design team continued to prepare the 90% cabinet drawings, develop the software, and develop the cyber security protocols. Maintenance procedures are being developed as well; the alarm set points are being determined by the project team.

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.

- Continued to modify the Autosampler (Real-Time Detecting, Optimized-Sample-Selection [RDOSS] system) for stack monitoring. The RDOSS is fitted with a gas chromatograph flame-ionization detector (GC-FID) and Ultra Violet- Differential Optical Absorption Spectrometer (UV-DOAS); this unit will provide real-time analysis of easily detectable indicator COPCs (e.g., NH₃ and mercury), hourly analysis of a suite of COPCs, and also collect targeted laboratory samples for analysis that will provide more accurate detection and characterization of Hanford COPCs. On-going activities consist of developing gas standards for testing, designing the test bed manifold and procuring the UV-DOAS units.

Stack and Boundary Monitors

Last update 10/26/2017: Stack monitor activities included:

- Initiate the design of the AX Farm stack monitors.
- Continue preparing draft SOW to obtain Cerex services for supporting stack monitoring activities.
- Submit the draft Plant Forces Work Review (PFWR) for comment. The PFWR addresses stack monitor installation.
- Review Cerex design reports for AZ Farm stack.

Establishing Safe Unrestricted Boundaries

Last update 10/12/2017: Quantitative Risk Assessments (QRA) for A, AP, and AW-Farms are in review with the Office of River Protection (ORP). Six additional QRAs are planned for FY2018 beginning with 242-A Evaporator.

Public Address System

Update: Excavation work at C Farm resumed. Excavations are scheduled to be finished the first week in November. AP Farm excavations are to follow.

KPP 6. Tank Operations Stewardship

Pilot SST Stewardship Program

Last update 10/26/2017: Remote Monitoring Equipment: WRPS is reviewing proposals. Bench-scale testing of both the level and temperature indicators were placed on-hold until the subcontractor is available. The subcontractor is currently assigned to support the leak detector replacement at AP Farm. The purpose of the bench-scale tests is to confirm the new equipment will

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.

connect to the Tank Farm Monitoring and Control System. **Last update 10/26/2017: FY LEAN 2015: Report/Work Location Evaluations:** The engineering services contract was awarded to ARES and a kick-off meeting was held. Scoping activities were also initiated during the week.

KPP 7. Hierarchy of Controls

Cartridge Testing and SCBA Alternatives

Update: Prior to June 30, 2017 cartridge testing was conducted at the AP Stack, A-101, 702-AZ, AN Exhauster, AW Stack, BY-108, AX-101, SX-101 and SX-104 tank farm locations. PNNL reports are complete for all of the above except for SX Farm. Copies of the completed reports are available [HERE](#). In August, cartridge testing was performed at the AX Stack. The PNNL reports for the SX Farm and the AX Stack are currently being written. More information on these cartridge tests will be made available as the reports go final. PNNL has developed a summary report rolling up the information contained in the cartridge testing reports issued to date. This summary report is currently being reviewed by WRPS management. The final summary report is expected soon. Cartridge testing for FY-2017 was completed at the end of August. Cartridge testing for FY2018 is slated to begin in January/February of 2018.

Key Performance Parameter 7
Provide options to promote the hierarchy of controls for chemical vapor respiratory protection beyond current use self-contained breathing apparatus.

To date, the third party (STC) review has indicated that full face air purifying respirators (FFAPR) equipped with the Scott 7422-SC or the Scott 7422-SD1 cartridge provides adequate protection for SEG 1 work activities at the following locations:

- AP Farm
- 241-AY
- AZ Farm
- SY-102
- A-101
- AN Farm
- AW Farm

Mobile Laboratory

Last update 10/19/2017: Last week, efforts focused on issuing a new contract for RJ Lee to support FY2018 activities.

✦ Personal Vapor Monitor

Update: Laboratory testing continued on the prototype sensor chip. Testing focused on exposing the sensor to humidity and ammonia, which allows for development of the algorithm needed to convert a raw signal to concentration.

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.