



washington river protection solutions **Safety Flash**
Industrial Hygiene February 6, 2017

AW Farm Temporary Fence line

This Safety Flash provides notification of a temporary fence that will be installed in the northwest corner of AW Farm to facilitate the installation of a new bottle change tent. This temporary fence will become the new AW Farm boundary. A RAD survey will be performed on the ground outside the temporary fence in order to downgrade the Radiological Buffer Area to an Underground Radioactive Material Area. An IH Boundary Assessment Review has been completed on the location to be down-posted. IH findings are acceptable and within good industrial hygiene practices.

The existing AW Change Trailer is 10' x 30' and only accommodate a crew of approximately 5 SCBA users at a time, which is inadequate for the future mission. The new Bottle Change Tent will support 30+ workers which are needed to replace the AW-106 pump, which must be operational by May 2017 in order to support the EC-07 evaporator campaign.

The IH boundary assessment concluded the fence line modification provides a safe distance from the AW Farm emission sources. Potential exposure levels less than 10% of the Occupational Exposure Levels (OEL is based on an 8-hour time weighted average) is anticipated. The tank farm exhausters AW-106 and associated process emission sources and review of IH Field samples were used for safe distance determinations.




ESH&Q Industrial Hygiene - AW Farm Temporary Fence Line

Tank Operations Contract
Chemical **Protection Program** Office Weekly Report
February 9, 2017

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

CPPO continues to support the development and review of the *Chemical Vapors Action Plan (CVAP)* and the *Hanford Vapors Integrated Safety Management Strategy*. Once the CVAP is finalized, the CPPO weekly report will be restructured to reflect the comprehensive vapors mitigation approach as envisioned in the CVAP.

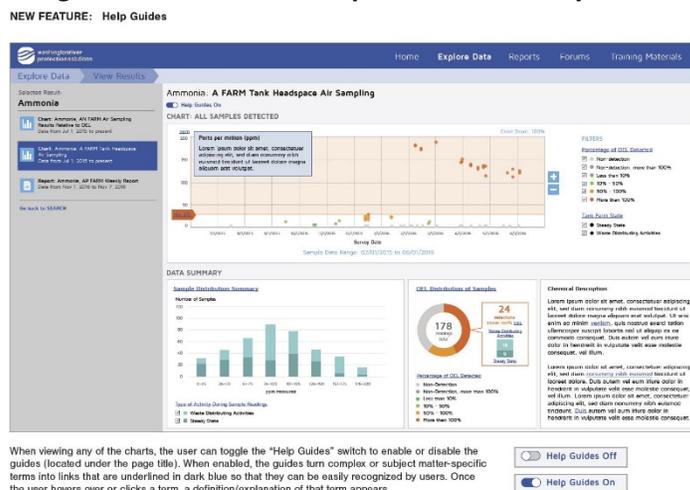
The CPPO team is a multi-disciplined team, including technical subject matter experts, with proven abilities for effective communication. CPPO Subject Matter Experts (SME) participated in the Integrated Sampling Strategy Data Quality Objective (DQO) kickoff meeting this week. CPPO SMEs are participating in several of the sub groups tasked with detailing the data requirements. Through the DQO's efforts, WRPS strives to be fully apprised of the specifics to which future data must adhere, ensuring the successful completion of several tank farm projects.

The CPPO reviewed new data from the RJ Lee Group mobile lab. CPPO worked with RJ Lee Group on process improvements, including ways in which to present information so that it is meaningful in the context of data generated by IH and the Vapor Monitoring Detection Systems (VMDS). RJ Lee Group is going to begin collecting samples from the stack using a Proton Transfer Reaction Mass Spectrometer (PTR-MS). Co-locating this measuring tool with the sampling devices used by VMDS and IH, and collecting samples coincidentally, may contribute to the sampling credibility.

CPPO is an active participant in the Health Planning Process (HPP) meetings, a collaboration between WRPS and Pacific Northwest National Laboratory (PNNL). The team conducts rigorous literature reviews, regulatory document reviews, best industry practices reviews, and consults the most up-to-date references to determine the adequacy of WRPS's current Occupational Exposure Levels (OEL). An enormous task, the team creates weekly reports documenting their findings, and refining recommendations for acute and chronic OELs for chemicals of potential concern (COPC). Recommendations are expected in the coming weeks.

CPPO team members attended this week's Phoenix Steering Team Meeting where the Phoenix Tank Vapor Data Access and Visualization Project **mockup** was previewed. The shared commitment and vision for the end user interface is to prioritize ease of use, provide meaningful contexts, and ensure clarity. Significant improvements to the visualization were noted, and additional changes are expected weekly as the software is fine-tuned.

Figure 1. Phoenix Mock Up Preview February 2, 2017



When viewing any of the charts, the user can toggle the "Help Guides" switch to enable or disable the guides (located under the page title). When enabled, the guides turn complex or subject matter-specific terms into links that are underlined in dark blue so that they can be easily recognized by users. Once the user hovers over or clicks a term, a definition/explanation of that term appears.

2. CPPO COMMUNICATIONS

Center for Toxicology and Environmental Health (CTEH) Director of Toxicology, Dr. John Kind, is developing a historical summary outlining the Hanford vapors management program from the beginning to the current time frame.

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Communications with the Workforce

A presentation of the *Comprehensive Vapors Action Plan* was given by the Chemical Protection Integration Manager.

The AOP-15 procedure, *Response to Reported Odors or Unexpected Changes to Vapor Conditions*, was revised on Thursday, January 26, 2017. The revision added requirements for odors detected outside of tank farm boundaries. The full procedure is available at this [link](#).

ESH&Q Industrial Hygiene Flash was distributed on Monday, February 6, 2017, regarding the AW Farm temporary fence line to facilitate the installation of a new bottle change tent. The temporary fence will become the new AW Farm boundary. The new bottle change tent will support 30+ workers which are needed to replace the AW-106 pump, and must be operational by May 2017 in order to support the EC-07 evaporator campaign.

The CPPO Notebook presentation for February 9, 2017, is the WRPS response to the DOE Office of Inspector General (OIG) recommendations from the OIG report.

This week's CVST meeting was scheduled for February 8, 2017, from 2 to 4 p.m. at 2704HV/G206, but was cancelled due to inclement weather. Past presentations are available on the [CVST Portal](#) under [Presentations](#).

The CVST Communications subcommittee will meet Monday, February, 20, 2017, from 3 to 4 p.m. at 2704HV/B226. The goal of this meeting is to identify topics to highlighted or receive additional information on the subject.

The CVST New Technology subcommittee was to have been held on Wednesday, February 8 from 3 to 4 p.m. at 2704HV/B226, but was cancelled due to inclement weather. The goal of this meeting is to review new technology topics as relates to tank farms and receive additional information on the subject matter.

The CVST Chemical Cartridge subcommittee was to have been held on Wednesday, Feb. 8 from 10 to 11 a.m. at 2704HV/D212, but was ended prematurely due to inclement weather. This subcommittee will meet Tuesdays at 9 to 10 a.m.

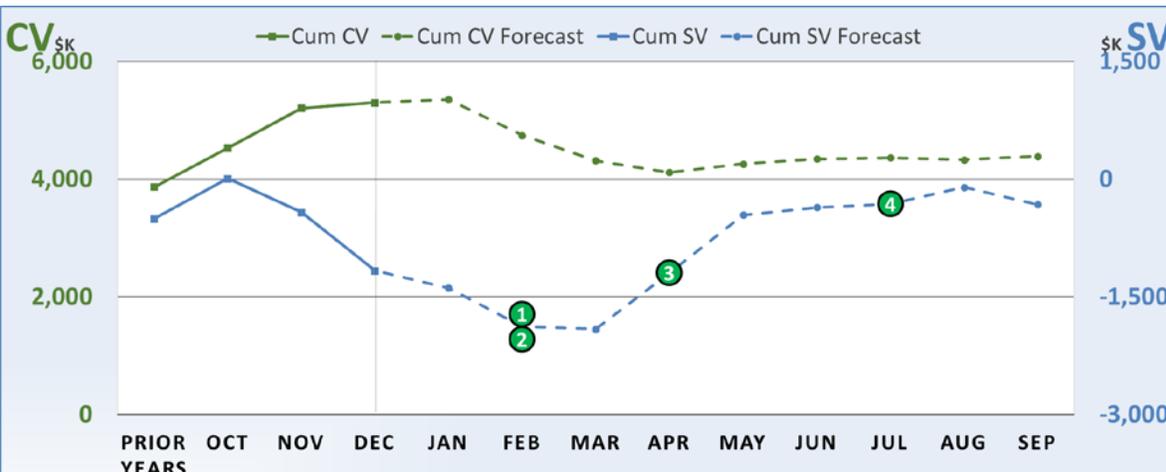
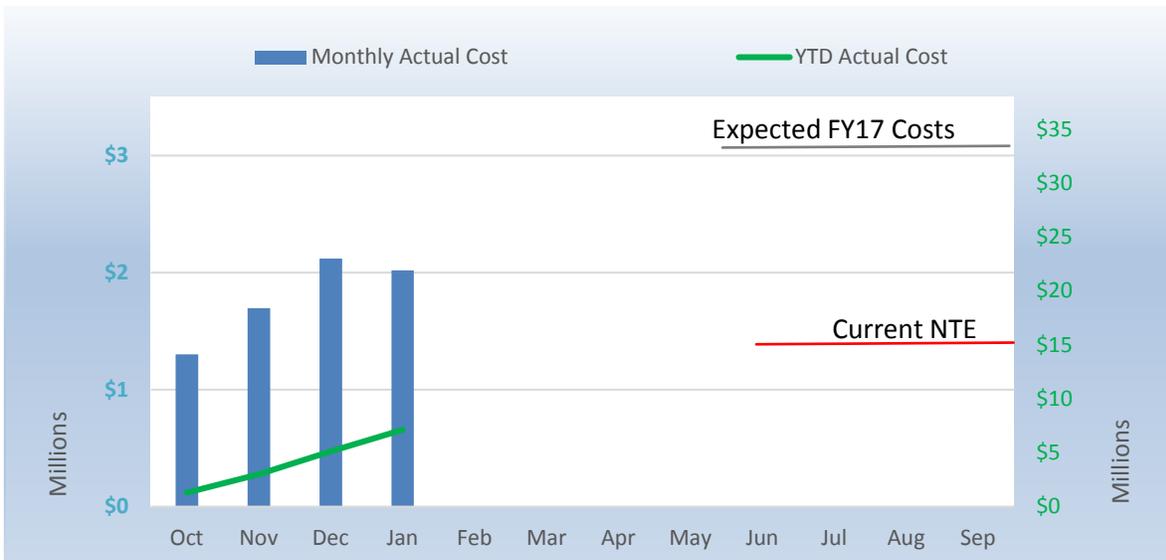
HanfordVapors.com Posts

On the [Vapors Sources](#) page, a link to the Centers for Disease Control (CDC) website providing [general information about environmental odors](#)

On the [Individual Sensitivity](#) page, a link to a [CDC discussion of potential health effects caused by environmental odors](#)

3. PERFORMANCE TRACKING

WRPS continues to address chemical vapors recommendations gathered from a variety of expert groups. The uncertainty of funding has delayed some of the projects that were scheduled to start in December and January. However, we have continued to perform work for less than initial estimated costs due to efficiencies. To-date this year we have spent \$7.1M (47%) of our official NTE value of the \$15M, with a much more vigorous workload ahead the expected spending for the fiscal year is \$33M. The Comprehensive Vapor Action Plan has manifested the scope to perform, and we will be seeing an increase in work over the next several months.



Milestones	1	2	3	4
<ul style="list-style-type: none"> ● Complete ● On Schedule ● At Risk ● Late ● - Within 15 days of Terminal date ● - Projected to miss Terminal date ● Under Negotiation 	<ul style="list-style-type: none"> 1 Complete TVAT Response Phase 1 Results & Recommendations Report 	<ul style="list-style-type: none"> 2 Submit Final Chemical Cartridge Testing Reports 	<ul style="list-style-type: none"> 3 Complete 242-A Stack Extension 	<ul style="list-style-type: none"> 4 Complete Phase 2A PA System Permanent Install

4. TVAT PHASE 1 and PHASE 2 DETAILED STATUS

TVAT Recommendations 1 and 9; Headspace Sampling: As reported last week, for FY 2017, headspace sampling is being re-planned after the impacts to the transfer schedule caused by the switch of AP-106 and AW-106. There are only five waste disturbing activities planned so it is critical headspace sampling occurs during these five activities. The IH sample plan has been finalized.

Stack sampling (AP) is currently ongoing during AY-102 retrieval.

TVAT Recommendations 2, 7, 16; Chemical Plating (Aerosol Study): The Aerosol Study was pushed to FY19 for budgetary reasons.

TVAT Recommendations 3-5; IH Instruments: No update.

TVAT Recommendation 6; IH Personnel Monitor Equipment: No change in status. C₂Sense is developing a personal ammonia sensor under funding from DOE-EM. Under this contract, DOE requested that WRPS support testing of this device. WRPS is coordinating between C₂Sense and RJ Lee Group to support prototype testing. The SOW to continue development of this device to the point of commercial production has been written and is in review.

TVAT Recommendation 8; Dispersion Model Review: No change in status. Meetings were held this last week to further clarify the FY17 modeling project scope. The SOW produced last week raised several questions that need to be resolved before the project scope can be finalized.

TVAT Recommendation 10; Review/Update Chemical of Potential Concern (COPC) Listing: PNNL is on track to publish the OEL recommendations for COPCs where regulatory guidance exists by the end of February and high priority COPC OELs by the end of March.

TVAT Recommendations 11-13, 15, 17-18; PNNL Health Study Roadmap: A schedule for FY2017 has been developed for the Health Process Project. The project is broken down into seven tasks: 1) Schedule; 2) Establish Tank Operations contractor assessment team; 3) Establish an External Peer Review Health Panel; 4) Implement Routine Analysis and Screening Process for Updating COPCs; 5) Establish Acute/Transient and Chronic Exposure Action Levels; 6) Evaluate Computational Approaches for Predicting Exposure and Delivered Dose; and 7) Database Implementation and Management.

Weekly Accomplishments:

- Task 3: Currently drafting recommendations.
- Task 4: Reviewing PID response factors for COPCs and a variety of compounds.
 - Reviewing analytical methods and met with the organic analytical team at 222-S.
- Task 5: Completed initial draft reports for chronic and acute OELs.
- Task 7: The database test site has been tested for bugs.
 - Hyperlinks have been converted to buttons in the recommendations and document exchange tools.

TVAT Recommendations 14; Evaluate Medical Surveillance Program: ORP Action. No status.

TVAT Recommendations 19, 20; Toxicology Studies: ORP Action. No status.

TVAT Recommendation 21; Rounds and Routines: The Rounds and Routines procedure was submitted to work-flow for final review and approval with a due date of 3/1/17.

TVAT Recommendation 22; Acute Bolus Assessment (RJ Lee Group Mobile Lab): The mobile lab continues to support the AY-102 retrieval. Due to adverse weather conditions, no data was collected during the fifth week of waste transfer operations. Data from the sixth week of sampling will be submitted to WRPS on 2/9.

TVAT Recommendation 28; Chemical Vapor Guidance Manual: No update; currently on hold.

TVAT Recommendations 29, 30; Enhanced Training: The first enhanced Chemical Hazards Awareness Training (CHAT) class was taught this week. The class was well received by the participants who gave good reviews. The enhanced CHAT class was presented to the HGET review board this week.

TVAT Recommendations 32, 36; Bolus Assessment/Medical Stakeholders: ORP Action. No status.

TVAT Recommendation 33; Vapor Monitoring Detection System (VMDS): WRPS hosted engineers from Providence Photonics (January 23-26) who 1) installed and tested the fixed Optical Gas Imager (OGI, Fixed FLIR), 2) tested the portable OGI integrated with the QPT 100, and 3) held training for WRPS personnel on the methodology and operation of the fixed OGI and QPT 100. The fixed OGI is a permanently mounted OGI that is mounted on the NE corner of the AP Tank Farm. It is configured to autonomously scan the tank farm for chemical vapor plumes that contain ammonia. The QPT100 is an industrial tablet loaded with proprietary software from Providence Photonics that, when paired with an OGI, can determine the emission rate in mass per time for a chemical vapor plume containing ammonia. Providence Photonics presented preliminary results from field testing conducted early in the week demonstrating the fixed OGI could display a plume and plume behavior from an exhauster. The team also demonstrated that the portable OGI with the QPT 100 could estimate the emission rate of ammonia from an exhauster.

TVAT Recommendation 34; Vapor Control Zones/Vapor Reduction Zones (VCZs/VRZs): The final review was completed on the revised procedure TFC-ESHQ-S_C-48, *Managing Tank Chemical Vapors*, in support of VCZ/VRZ review.

TVAT Recommendation 35; Cartridge Testing: Four cartridge reports have been issued to HAMTC for their review. AP Exhauster, SY-102, A-101, and SBY108 are the named reports.

A draft of the AY/AZ Cartridge Report is being reviewed by WRPS and is pending release.

This weekend, additional cartridge testing is scheduled to be performed during a waste disturbing activity. The test will take place in conjunction with the next waste transfer.

The cartridge testing team initiated a contract with a fabricator to test PAPR and MSA cartridges. The testing unit is expected to be complete in early summer; testing will begin immediately after receipt of the testing unit.

TVAT Recommendation 37; IH Improvements Tracking: No update.

TVAT Recommendations 38-39, 41; Management Commitment: No update.

TVAT Recommendation 40; Improve EJTA: No further actions required.

TVAT Recommendation 42; Revise Exposure Letter: No further actions required.

TVAT Recommendation 43; IH Covello Training: No change in status. In FY 2016, scheduled multiple risk communication sessions with a nationally recognized risk communication expert, Dr. Vincent Covello. Covello's research on the topic of risk communication was specifically cited in the TVAT report. (According to preliminary discussions with Paul Gagnon) WRPS is planning another round of training and strategy sessions for select WRPS managers, employees and Industrial Hygiene Technicians and front-line supervisors in FY 2017. Communications & Public Relations has contacted Dr. Covello directly to discuss FY17 Q2 availability. Options will be provided to Industrial Hygiene to coordinate scheduling.

TVAT Recommendation 44; Public Address (PA) System: No change in status. The three contracts are underway for support from Mission Support Alliance (MSA), ARES, and Safer. The conceptual design has been finished for location of the speakers and reader boards in all the farms. ARES is now moving on preliminary design for Phase 2A/2B, MSA continues design and install support for wireless access point, and SAFER is expected to deliver the sound propagation study covering all Phase 2A-D Farms.

TVAT Recommendation 45; Lab Support/Determination & Development of Similar Exposure Groups (SEGs):
No update; currently on hold.

TVAT Recommendations 46, 47; Communications: No update.

5. OTHER VAPOR ACTIVITIES

242-A Ammonia Analyzer Upgrade – No change in status. Phase 1 of the Ammonia Analyzer has been initiated and a contract is being established with Cerex to develop the software.

242-A Stack Extension – As reported last week, the RFP for the 242-A Stack Extension went out for bid the week of 2/2/2017. The team is looking to award a contract by the end of February.

Leading Indicators - As reported last week, the leading indicator contract has been put in place to continue FY 2017 work. PNNL has developed and submitted a project schedule. However, further progress is dependent on availability of headspace, cartridge breakthrough, VMDS, and Mobile Lab data. Little progress is possible until this data becomes available.

Abatement Technologies – As reported last week, an integrated project team was established to study the feasibility of installing a Strobic Air Tri-Stack ventilator on the AW stack. The study is complete and will be published as soon as the report is cleared for public release. Two abatement technology projects were funded in FY17; they are the Strobic Air Tri-Stack installation on the AW Stack, and continued development of the NUCON thermal oxidation technology.

Strobic Air Tri-Stack Ventilation System: Tank Farm Projects is leading the design and installation of the ventilation upgrade for the AW stack. A project schedule has been developed and contracting is in process.

NUCON International Thermal Oxidation System: NUCON is developing a novel thermal oxidation process based on the internal combustion engine. Tank vapors are pulled into the engine via the induction system and combusted in the engine cylinders. The tank vapors are destroyed in the combustion process. WRPS is providing support to resolve technology maturation as needed. NUCON is funding the development and

proof of concept testing of their thermal oxidizer. WRPS will witness these tests and make recommendations for conducting a pilot scale test on the Hanford site in FY18. WRPS is participating in biweekly project status meetings. Proof of concept testing is currently scheduled for early March.

SCBA Equipment Evaluation – No change in status. Field testing of SCBAs during Phase 2 testing in a non-hazardous setting for approximately two weeks at the Volpentest HAMMER Federal Training Center was completed 12/07/16. Phase 3 for ordering the SCBA units and equipment chosen after Phase 2 testing was completed is about to be initiated.

Certification of existing air-line equipment was completed the week of December 19th. Field crews will begin using air-line during single-shell tank and double-shell tank annulus videos in late January/February. This activity will serve as a pilot for determining if other projects can effectively utilize air-line systems across tank farms.

VMDS Design and Chemical Vapor Quantitative Risk Assessment (Design Agent: Kenexis) – WRPS hosted engineers from Kenexis (January 24-25) who 1) participated in a WRPS cross sectional working group for developing inputs and assumptions aimed at refining the Quantitative Risk Analysis (QRA) of the chemical vapors and sensor placement analysis, 2) presented to management a discussion on the philosophy and process for the QRA and sensor placement analysis. The QRA, when coupled with sensor location, is used to demonstrate the effectiveness of a given VMDS concept. The sensor location(s) are manipulated until the desired VMDS performance is achieved.

Chemical Vapor Data Quality Objectives (DQO) – As reported last week, WRPS is in the process of assembling a cross sectional team to develop Data Quality Objectives (DQO) to integrate many of the TVAT Phase 1 and 2 data collection activities. By developing DQO for the TVAT activities, the collection of data for each TVAT activity will have improved efficiency and the collection data can then be shared between activities, which will ultimately result in comprehensive data product.

Phase 2 Implementation Plan – The Integrated Project Team (ITP) is providing feedback on the development of the Phase 2 implementation plan currently titled Comprehensive Vapor Action Plan. The completion target date is mid-February.

AY-102 Retrieval - The stack and fence line monitors have been operating and functioning properly since they were installed and have not shown any issues with reliability. The data they are providing is consistent with the results from IH monitoring and have confirmed where issues with sampling methodology exist during waste disturbing activities. The in tank monitors have had communication and calibration issues that are being worked through and is continually improving.

The mobile lab has collected over 20 million readings during normal and AY-102 Retrieval during the month of December. Throughout January, the mobile lab has continued to conduct monitoring during retrieval operations and WRPS is awaiting those results. The lab has been providing the background levels for both the Hanford site, as well as the Pasco and Richland areas. RJ Lee provides weekly reports of the data that has been collected and also provides time and location information for when levels above background are detected. The lab is sensitive enough to pick up exhaust from vehicles that drive by while it is monitoring.

6. VAPORS MITIGATION PROGRAM PLAN - TOP RISKS

CPPO Risk Weekly Update:

The subset of the Vapors Mitigation Risk Register that is getting the most attention this week is shown below in **Table 1**.

ID/Title	Current Status	Handling Actions	Current Risk Level
VIP-007 Excessive Work Stoppages	Currently inclement weather has caused a significant decrease in work efficiency through safety stand downs due to icy conditions, lost shifts, and cancelled work days.	1. Plan work based on historical data of stoppages.	High
VIP-020 222-S Labs Analysis Throughput is Insufficient	222-S Labs is currently experiencing impacts in throughput due to scope transitions to WHL. Funding and personnel transfer issues are contributing the schedule delays.	1. Hire new chemists/engineers to staff lab. 2. Establish alternate laboratories if necessary.	High
VIP-004 Integration with Other Key Projects More Complex than Expected.	Transition to operations/design and install of VMDS systems in tank farms is forecasted to encounter integration risks.	1. Identify key program interfaces. 2. Engage with program/project managers early.	Medium
VIP-024 Equipment design and Current Requirements are Incompatible with Tank Farm Infrastructure	Software and hardware communication issues are expected to continue in the transition to operations of VMDS systems. Tank Farm communication infrastructure may not be able to support expansion of vapor monitoring bandwidth.	1. Identify vapors monitoring infrastructure requires within the tank farms. 2. Start upgrades and equipment installs in order to support vapors monitoring activities.	Medium

Table 1. Vapors Mitigation Risk Register – Top Risks