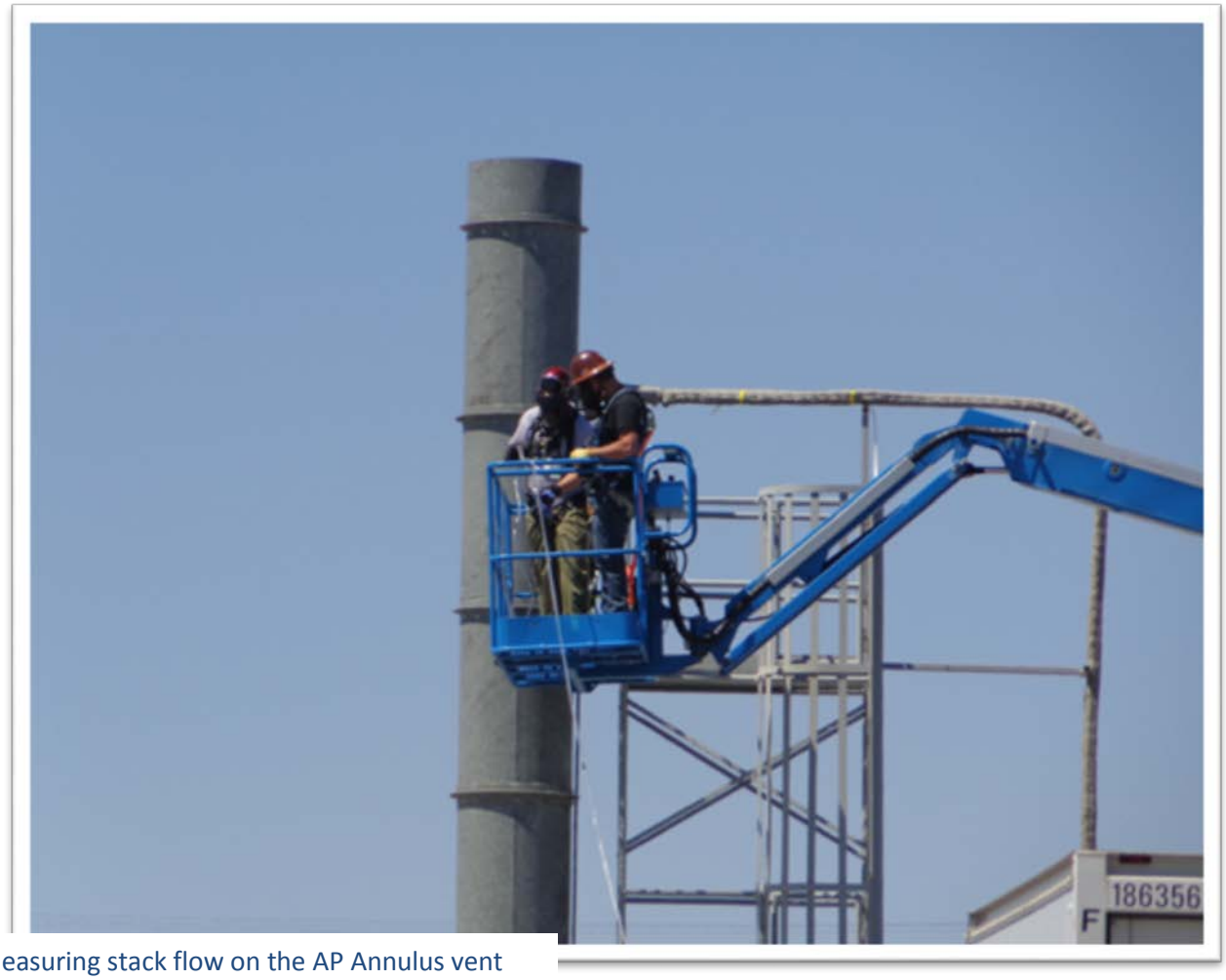
washington river protection solutions

CPPO Chemical Protection Program Office



Measuring stack flow on the AP Annulus vent system in Full-Face Air Purifying Respirators (FFAPR) – May 2017

Tank Operations Contract
Chemical Protection Program Office Weekly Report
June 1, 2017

Department of Energy Contract NTE 16-TF-0089

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

CPPO continues internal reviews to finalize the external assessments recommendations table. The table compiles the over 320 recommendations generated by the following external assessments: the National Institute for Occupational Safety and Health (NIOSH), Tank Vapor Assessment Team (TVAT), Office of Inspector General (OIG), Office of Enterprise Assessments (EA-32), Center for Toxicology and Environmental Health (CTEH), as well as the recommendations contained in the reports generated from the TVAT FY14-15 activities.

CPPO continues to develop metrics to support a Comprehensive Vapors Action Plan (CVAP) monitoring dashboard. Multiple metrics are in various stages of development and review.

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Communications

- Chemical Protection Communication

Rob Gregory presented vapors information at last week's Chemical Vapors Solutions Team meeting, a tape of which will be posted on the Hanford Vapors website. He reported that litigation is ongoing.

The CPPO Notebook published on May 25, 2017, is titled *Update on testing for the Vapor, Monitoring and Detection System (VMDS)*. To date, 14 recipients of the notebook indicated their intention to present the material to their staff. This week's CPPO Notebook is titled *Human Odor Perception and Chemical Exposures, Part 1.* Dr. John Kind, Principle Toxicologist for CTEH, authored this informative presentation. The first of five parts is offered this week.

Key Performance Parameter 1

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

Hanford Vapors Website Updates

The Hanford Vapors Website posted one item last week:

- Vapors weekly update – May 25

- Data Analysis and Visualization Tool (PHOENIX)

Update: Currently managed by CPPO, the PHOENIX team is finalizing the functions of the Data Analysis and Visualization (DAV) tool prior to its full-scale test launch. As many as 15 people from Industrial Hygiene, legal, craft, IT, and the CPPO are slated to begin testing the DAV tool in two weeks.

Website Statistics and Use

Table 1. Hanford Vapors Website

In May, the HanfordVapors.com website saw a 22% increase from the previous month with an average of 187 hits per day. More people visited the site in May than in any month since December 2016 making it the fourth busiest month on record. While the data do not show which specific pages were accessed, daily traffic data shows the highest number of occurrences were on May 9. This corresponds to the day of the Hanford Site Take Cover due to the partial collapse of PUREX tunnel 1. Other significant events that occurred around high-traffic times include: evaluation of the contamination found during the examination of the annulus of AZ-101, notification of work to extend the 242-A evaporator exhaust stack, and the release of two Hanford Tank Vapors weekly updates (May 18, and 25).

CVAP Recommendation Weekly Status

Phase	Actions	Status
1	61	Completed
2	2	Completed
	4	DOE Action
	24	In Progress
	26	Pending

CVAP Recommendation Status Summary

CVAP Number	Category	Title	Phase 1 Status	Phase 2 Status
TVAT 1	Site Characterization #1	Headspace Sampling Program & Schedule	☑☑	②④
TVAT 2	Site Characterization #2	Chemical Plating (Aerosol Study)		①
TVAT 3	Site Characterization #3	Instruments: Sources Non-Headspace	☑☑☑	
TVAT 4	Site Characterization #4	Instruments: Detect, Locate, Quantify	☑☑	
TVAT 5	Site Characterization #5	Instruments: Alarming & Communication Devices	☑☑	☑
TVAT 6	Exposure Assessment #1	IH Personnel Monitor Equipment	☑☑☑	③⑤
TVAT 7	Exposure Assessment #2	Field Stability & Recovery Study		①②
TVAT 8	Exposure Assessment #3	Dispersion Model Review	☑	②
TVAT 9	Dose Response Assessment #1	Conduct Headspace Sampling	☑	②③
TVAT 10	Dose Response Assessment #2	Review/Update COPC Listing	☑	②③
TVAT 11	Dose Response Assessment #3	Tank Chemical Mixture Toxicology Study		❶②
TVAT 12	Dose Response Assessment #4	Toxicity Effect for COPCs		❶②
TVAT 13	Dose Response Assessment #5	Acute OELs		①②
TVAT 14	Dose Response Assessment #6	Evaluate Medical Surveillance Program		❶
TVAT 15	Dose Response Assessment #7	Mixture Effects		①
TVAT 16	Dose Response Assessment #8	Aerosols Study		①②
TVAT 17	Dose Response Assessment #9	Health Study Research		①②③④
TVAT 18	Risk Characterization #1	OEL-Ceiling Limit (OEL-C)		①②
TVAT 19	Risk Characterization #2	Toxicology Study		❶②
TVAT 20	Risk Characterization #3	OEL-C Toxicology Study		①
TVAT 21	Risk Characterization #4a	IH Rounds & Routines	☑	②③
TVAT 22	Risk Characterization #4b	Acute Assessment Bolus		①②
TVAT 23	Risk Characterization #4c	Medical Surveillance	☑	②③④
TVAT 24	Risk Management #1a	Hire IH Staff for Vapor Exposure	☑	
TVAT 25	Risk Management #1b	Train/Maintain IH Staff for Execution and Evaluation	☑☑☑	
TVAT 26	Risk Management #1c	IH Staff Evaluate Work Practices	☑☑	
TVAT 27	Risk Management #1d	Train/Maintain IH Staff - Gap Analysis	☑☑☑☑	
TVAT 28	Risk Management #1e	Chemical Vapor Guidance Manual	☑	②
TVAT 29	Risk Management #2	Chem Vapor Worker I/II Training	☑	②
TVAT 30	Risk Management #3	Enhanced CHAT	☑☑	
TVAT 31	Risk Management #4	IH Staffing	☑☑	③④
TVAT 32	Risk Management #5	Bolus Assessment		①
TVAT 33	Risk Management #6	Vapor Detection Technology - Pilot Study	☑☑☑	②⑤⑥
TVAT 34	Risk Management #7a	VCZs/VRZs	☑	②③
TVAT 35	Risk Management #7b	Cartridge Testing	☑☑☑	④
TVAT 36	Risk Management #8	Medical Stakeholders	☑☑	
TVAT 37	Risk Management #9	IH Improvements Tracking	☑	
TVAT 38	Risk Management #10	Management Commitment - Improve Systems	☑☑☑☑	④
TVAT 39	Risk Communication #1	Management Commitment - Transparent Communications	☑	
TVAT 40	Risk Communication #2	Improve EJTA Process	☑	☑
TVAT 41	Risk Communication #3	Management Commitment - Employee Involvement	☑	②
TVAT 42	Risk Communication #4	Revise Exposure Letter	☑	
TVAT 43	Risk Communication #5	IH Risk Communication Training	☑☑	③
TVAT 44	Risk Communication #6	PA System / SOEN	☑	②
TVAT 45	Risk Communication #7	Lab Support/Determination & Development of SEGs	☑☑☑	④
TVAT 46	Risk Communication #8	Communications from President	☑☑	
TVAT 47	Risk Communication #9	Medical Stakeholders Communication	☑☑	

Recommendations from other reports are forth comming

Completed: ☑ Sub Action #: ② DOE Sub Action: ❶

Page 1 of 1 Date Printed: 6/1/2017

Figure 1. CVAP Recommendation Table

The chart in **Figure 1** above illustrates the progress made against the recommendations from the Tank Farm Vapors Advisory Team (TVAT) report majority of which have a targeted completion date of September 30, 2017. The CVAP Recommendation Weekly Status report format will be modified over the next month. The data will transition from a focus on the TVAT recommendations to incorporate the additional recommendations made in the DOE-OIG, NIOSH, and EA-32. The information will be arranged around the CVAP Key Performance Parameters (KPPs), and will summarize the progress made on each recommendation, providing a single page progress report on all vapors projects.

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

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

Update: Updates to RPP-22491, *Industrial Hygiene Chemical Vapor Technical Basis,* are underway. An outline of the revisions has been developed, and a list of the changes was submitted for IH management review. The template for RPP-22491 revisions is being created. The GAP analysis for RPP-22491 is ongoing.

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.

- Institutionalizing the Vapors Program with the IH Program Requirements

Update: The IH Manual draft is taking shape; its structure and contents compiled into an Excel spreadsheet. The spreadsheet maps out the requirement matrix, and is a tool in the GAP analysis. The focus of the IH Program Manual is on Chemical Vapor Program aspects, and it revises existing standards and procedures. The IH management is reviewing the spreadsheet for completeness and accuracy.

- Health Process Plan

Last update 5/25/2017: PNNL Health Study Roadmap: A schedule for FY17 has been developed for the Health Process Project. Accomplishments:

- Task 1: Schedule
- Task 2: Establish Tank Operations Assessment Team.
  - An interim Tank Operations Assessment Committee has been identified. A charter for the Assessment Committee is developed and in review.
- Task 3: Establish an External Peer Review Health Panel.
  - Submitted the Draft External Review Recommendations. A meeting with Sr. management to finalize the membership in the Assessment Committee was held

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 FY 2018.

on March 14th. WRPS reviewed PNNL's assessment team recommendations, and drafted a charter for membership and function. PNNL is in the process of reviewing and providing additional comments.

- Task 4: Implement Routine Analysis and Screening Process for Updating COPCs.
  - A draft of the sampling and analytical recommendation report is in internal review.
  - The COPC report update is underway.
- Task 5: Establish Acute/Transient and Chronic Exposure Action Levels.
  - Submitted draft nitrosamine and furan high priority OEL documentation to PNNL management for communications with WRPS.
- Task 6: Evaluate Computational Approaches for Predicting Exposure and Delivered Dose.
- Task 7: Database Implementation and Management.
  - Updated the data forms module.
  - Manually tested the updated data forms to find bugs.
  - Manually tested the Chemical Dashboard, COPC Proposals form, and the filtered drop downs in tables.
  - Examined the chemical mixture methodology (CMM) to prepare for the Risk Assessment task.
  - Began drafting two Risk Assessment workflow – one for analysis and one for visualization.
  - Worked on the citation management capability.

Database Implementation and Management

Last update 5/25/2017: In FY 2016, PNNL developed a database to review and update the COPC list and associated OELs. See Task 7, Health Process Plan, for the latest update.

Leading Indicators

Last update 5/25/2017: For the next few months, the Leading Indicators team will be focused on supporting the integrated vapors data collection data quality objective (DQO) process. This DQO will drive data collection that will be used as the basis to validate and update the Leading Indicator Process. Accomplishments for the week ending 5/21 are shown below:

- Continued review of analysis code, ideas for any potential revision needs
- Continued investigation of the effect of series or parallel sampling in available data
- Continued investigation of existing data sources (content, format, etc.) and how to best incorporate into analysis

- Parity Implementation with Established Programs

Update: The successes in implementing parity with established programs are as follows:

- Enhanced CHAT continues to be well received. As of 5/18/2017, 8 CHAT Initial and 12 CHAT refresher classes have been held.
- Training has hired an additional two subcontractors to help complete required training documentation for the Industrial Hygiene Technician (IHT) Training Program.
- IHT Continuing Training has held 4 sessions (2 each week) with great response to the hands on training for Physiological Monitoring Instruments and Theory on Photoionization Detector (PID) operation. Training continues until June 7th. Make-up sessions may be offered.
- Chemical Worker Tier One is in the Design Phase; comments are being incorporated from key stakeholders and a draft storyline is being prepared. Draft slides were released for review on 5/23; the comment period is scheduled to end by 6/7/2017. The slides will incorporate the comments received from the key stake holders.
- Chemical Worker Tier Two and Three are being developed. However, the focus is on completing and implementing Chemical Worker Tier One.

On May 18, 2017, WRPS, CHPRC, HAMMER, and Labor held an IHT Training Program kickoff meeting, the goal of which is to "[d]esign, develop and implement an IHT fundamentals and continuing training program that will educate and develop independently competent and highly effective IHTs who are trusted and respected by the workforce." Expected to be launched in September 2017, the Industrial Hygiene Fundamentals course curriculum may include:

- Laws and Standards
- Math unit conversions and statistics
- Chemistry
- Physiology, anatomy, and toxicology
- Respiratory protection and PPE
- Industrial hygiene documentation
- Personal and area monitoring
- Using an industrial hygiene database

KPP 4. Engineering Controls

- 242-A Evaporator Stack Extension

Update: Installation activities continue. Last week, the design team completed the engineering change notice documentation along with the revised lift plan. In

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

parallel, changes were incorporated in the work package and submitted for review. The reviews proceeded over the weekend and comments were incorporated. Extension activities are scheduled to be complete by mid-June.

- Exhausters

  Last update 4/20/2017: New exhausters for A-Farm have been designed and are under construction. The design includes increased stack heights. Anticipated delivery date is September 2017.

- Strobic Air Dilution Fan

  Update: The Strobic Air subcontractor was on-site the week of 5/22 for tours and meetings with WRPS team members. Strobic staff provided an overview of their technology and reviewed functional requirements with project personnel. Moving forward, Strobic will design the appropriate equipment for AW-Farm, which they believe can be completed by the end of July.

- NUCON Thermal Oxidation Vapor Abatement Unit (VAU)

  Update: Efforts continue to establish functions and requirements for the NUCON VAU, which should be completed shortly. Work was initiated on a Technical Readiness Assessment and Technology Maturation Plan for the NUCON VAU. In addition, a draft presentation summarizing the recent proof-of-concept testing performed in Columbus, Ohio, was prepared.

KPP 5. Administrative Controls and Monitoring

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.

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

  Update: Last week, the 506A OP-FTIR and 507 UV-FTIR units were shut down as a result of an outage needed to support UV-FTIR modifications. In addition, a presentation was released by the CPPO organization, which provided an update on VMDS testing activities. Finally, efforts are on-going to review the viability of VMDS equipment and determine their path forward.

- Stack and Boundary Monitors

  Update: The design contract is being developed to install the AW/AX Stack monitors. The boundary monitors will become focal in FY18 after the individual stack monitoring activities are complete.

- Establishing Safe Unrestricted Boundaries

  Update: Upgrades to the Air Pollutant Graphical Environmental Monitoring System (APGEMS) continue, with the following being accomplished this week:

  - Held a status meeting with PNNL to update scope and schedule on their on-going modeling efforts.

- Public Address System

  Update: The Notification Public Address (PA) system installation is scheduled to begin in June. The team is waiting for excavation permits.

KPP 6. Tank Operations Stewardship

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.

- Pilot SST Stewardship Program

  Last update 5/4/2017: The SST-Stewardship activities are still in planning package status and as such have not received a cost account charge number (CACN). No work has been executed officially other than simple planning and execution strategies for TY-Farm.

KPP 7. Hierarchy of Controls

- Cartridge Testing and SCBA Alternatives

  Update: Rob Gregory reported the following at the CVST meeting held on Wednesday, May 24, 2017:

  To date, cartridge testing has been conducted at nine different locations. Eight of the tests were conducted under static conditions. One cartridge test was conducted during waste disturbing activities. The remaining eight tests were conducted at Double Shelled Tank (DST) locations and selected Single Shell Tank (SST) locations. The results of the eight static condition cartridge test were analyzed by PNNL. PNNL produced a report for all eight tests. The 3rd party has reviewed the PNNL reports. Good dialog has occurred between PNNL and the 3rd party. The 3rd party was very complementary of our testing methodology and did not disagree at all with testing methodologies. Feedback from the 3rd party was minor in nature. One example of a 3rd party comment was the PNNL reports should report test results as break through, not cartridge life. This type of revision would allow the industrial hygiene program to use breakthrough data in establishing an appropriate change out schedule, Instead of being locked into the PNNL report recommendations. The 3rd party is currently generating a summary/final report on the results of the eight tanks tested under static conditions. WRPS should receive the 3rd party's report by the end of June. If the 3rd

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

party report is favorable, WRPS plans to expand Air Purifying Respirator (APR) use to other farms. APR cartridge use at AP farm is going well. APR use has been expanded to other similar exposure group one activities. Our path forward is to conduct cartridge testing during waste disturbing activities and at other farms.

Moving forward, a new test apparatus (jig) has been built. The new jig is capable of testing cartridges from other manufacturers and powered air purifying respirator (PAPR) cartridges too. The next wave of testing will start at SX farm. Plans are to install an asphalt barrier in SX in 2018. It would be good to down grade from SCBA to APRs if the test results are favorable. The 242-A evaporator project is going strong. Completion is slated for end of July. Starting in early June, the extension to the 242-A evaporator stack is to begin. The stack extension will create better dispersion from the stack, and will improve monitoring capabilities. All stack extension activities at 242-A evaporator will wrap up at the end of July.

- Mobile Laboratory

Update: A-103 passive breather filter sampling was completed during the week. In addition, reference gas measurements were conducted for sixty-five compounds in an effort to compare measured values with calculated values. Finally, additional non-Hanford background measurements were collected throughout the Tri-Cities area.

- Personal Vapor Monitor

Update: C_2Sense, Inc. continues developing a personal ammonia sensor with funding from the Department of Energy – Office of Environmental Management (DOE-EM). Last week, a rough schedule of their development activities for FY17 was finalized.

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.

4. Vapors Mitigation Program Plan - Top Risks -CPPO Weekly Update

Update: The subset of the Vapors Mitigation Risk Register this week is shown in **Table 2**.

Table 2. Vapors Mitigation Risk Register

CVAP ID Number	Current Status	Handling Actions	Current Risk Level
004 Integration with other key projects more complex than expected.	Integration of field execution for VMDS in KPP 5 continues to refine the schedule, execution conflict concerns in SY Farm, A Farm, and AW stack monitoring/Strobic Air. Extension prior to EC-06 are at risk of schedule delays due to integration issues.	1. Identify key program interfaces early. 2. Engage with program/project managers early.	Medium
009 Resources not available when required.	Head Space Sampling may not occur this year due to lack of resources.	1. Identify key technical resources up front and secure availability.	Medium
030 Infrastructure (hardware) to handle data processing, storage, interrogation, and reporting is found to be insufficient for the quantity of collected data.	The projects under the CVAP program will collect huge amounts of data from many pieces of equipment in the field. Real time monitoring during AY102 retrieval in phase 1 has collected over 9 million data points, it is projected to increase to more than a billion data points in upcoming scope. This amount of data may prove to be unmanageable with current hardware and software infrastructure, a risk exists that additional infrastructure improvement must occur to effectively manage the data stream.	1. Engage with CTO Technology Management and Field Solutions to develop data handling and interrogation infrastructure.	High