WRPS Integrated Chemical Vapor Hazard Control Program

Monthly Report – October 2018

Published: November 20, 2018

At the end of Fiscal Year (FY) 2016, Washington River Protection Solutions LLC (WRPS) was completing Phase I of the *Implementation Plan for Hanford Tank Vapor Assessment Report Recommendations* (WRPS-1500142), developed to address Tank Vapors Assessment Team (TVAT) recommendations. The implementation plan actions were originally planned to occur in two phases. Phase I was completed at the end of fiscal year FY 2016. During the latter part of Phase I, multiple assessments were conducted on the progress of the implementation plan and/or the overall Industrial Hygiene (IH) program, including those conducted by the National Institute for Occupational Safety and Health (NIOSH), Office of Inspector General (OIG), Center for Toxicology and Environmental Health, LLC (CTEH), and DOE-Office Environment, Safety, and Health Assessments (EA-32). Assessment results, feedback from stakeholders, and the Phase II actions were incorporated into a comprehensive vapor management strategy, focusing on the vision that all workers on the Hanford Central Plateau continue to be protected by the comprehensive approach to vapors management, and that workers ***are safe and feel safe***. The *Comprehensive Vapor Action Plan* (CVAP), as the plan became known, presented the new implementation strategy, and replaced the *Implementation Plan for Hanford Tank Vapor Assessment Report Recommendations*.

The CVAP was organized around eight Key Performance Parameters (KPPs):

- Engagement and effectiveness measurement
- Industrial hygiene technical basis
- Industrial hygiene program parity
- Engineered controls
- Unrestricted work boundaries
- Single shell tank stewardship program
- Chemical vapor respiratory protection hierarchy of controls, and
- Support medical program enhancements

The Plan was implemented during fiscal years 2017 to 2018.

The Chemical Protection Program Office (CPPO) was established in October 2016. The mission of the CPPO is to provide independent monitoring of vapor action status, and facilitate the flow of clear and transparent information throughout WRPS and to stakeholders to promote understanding of Hanford tank vapors by:

- Providing independent measures of progress to ensure actions achieved the required intent
- Both leading and supporting vapors engagement and communication efforts

From FY 2017 to FY 2018, CPPO delivered KPP 1 of the CVAP: "[e]stablish a comprehensive vapor communication plan, engagement processes, and effectiveness measures," in part by publishing the *CPPO Weekly Report*. The weekly updated all the KPPs as described in the CVAP. WRPS's ongoing actions aimed at managing chemical vapor hazards from the Hanford Tank Farms are now focused around the outcomes of the CVAP. Instead of describing the outcomes in terms of KPPs, WRPS is now using the following descriptors:

- **People, Programs and Processes**
- **Mitigating actions/Engineering controls**
- **Information Sharing/Communication**
- **Sampling and Monitoring**

The CPPO Weekly Report is now the *WRPS Integrated Chemical Vapor Hazard Control Program Monthly Report.*

1. People, Programs, Processes

IH Tech Basis Updates

WRPS completed the update of RPP-22491, *Industrial Hygiene Chemical Technical Basis*, and developed detailed, institutionalizing documents in fiscal year (FY) 2018, as well as establishing a process to analyze new information in light of current scientific and regulatory information to determine if a new chemicals 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.

In FY 2018, IH completed a major revision to TFC-ESHQ-IH-C-48, *Managing Tank Chemical Vapors*, intended to "simplify risk classification categories, align terminology with industry standards, and assist in the demarcation and communication of areas with greater potential of tank chemical hazards." Exclusion Zones replaces Vapor Control Zone as the term used to demarcate "the boundary of potential vapor emission source greater than 50 percent of the OEL."

Exposure Assessments

TFC-PLN-34, *Industrial Hygiene Exposure Assessment Strategy*, is the published guideline for developing exposure assessments. TFC-IH-C-69, *Exposure Assessment Procedure*, was published on September 4, 2018. The exposure assessments for A Farm, AW Farm, and AP Farm are in Smartplant Foundation (SPF) for publication. TFC-PLN-173, *Use of FFAPR in Actively Ventilated Tank Farms*, is posted on the website for implementation in SY, AP, and AN Farms. It was edited to include AN Farm in September 2018.

Central Residence for Industrial Hygiene Technicians

"About 100 members of the WRPS IH staff will soon have a new home closer to the tank farms where they perform the bulk of their work," stated an October *Solutions* article. Building MO-2553 is commonly known as the 10-wide and is "the nearly completed office building on 4th Street, a little northwest of the PUREX plant."

IH Training

IH is working on the training plan for FY 2019 to include Part Two of the *Crucial Conversations*. Additionally, the *ToxiRAE Laboratory Preparation Training* for IHTs is ongoing.

Health Process Plan (HPP) and Charter 71

For FY 2019, there are three HPP reports that continue to be developed or finalized by Pacific Northwest National Laboratory (PNNL).

- ***Proposed Occupational Exposure Limits for Furans*** (PNNL-26775): This report is currently being evaluated by WRPS IH for the technical and economic impact of implementing the study recommendations.
- ***Proposed Risk-Based Approach for Nitrosamine Chemicals of Potential Concern*** (PNNL-26787): WRPS IH has accepted the risk-based approach for deriving OELs for nitrosamine class compounds. WRPS is determining the next steps for identifying and using the best available toxicology data to derive Hanford OELs for the nitrosamine-class tank vapor chemicals.
- ***Chemical Mixtures and Modeling Recommendations*** (PNNL-27089): PNNL scientists continue to refine the report. In October, the study authors began the process of assigning health code numbers to the COPCs. Health code numbers are used to guide the grouping of toxicologically similar COPCs to account for potential health effects of co-exposure to one or more groups of COPCs.

Chemical Worker Training

CTEH toxicologists visited the *Chemical Worker Tier III* training classes in October at the conclusion of each week's course. The toxicologists moderated Question & Answer (Q&A) sessions that gave the course trainees an opportunity to get answers to their questions regarding the toxicology and potential health impacts from tank vapor chemicals.

- **October 17, 2018:** Drs. Chris Kuhlman and Angela Perez visited the *Chemical Worker Tier III* training class and answered toxicology and health risk-related questions for 45 minutes. Questions included whether or not all COPCs had occupational exposure limits, the use of ammonia as a real-time leading indicator of potential COPC exposure, and the frequency of tank vapor constituent characterization. A question was asked about the

dust releases from the FFAPR filter cartridge. This question was deferred to WRPS IH.

- **October 24, 2018:** Dr. Perez visited the class of about 15 workers and Dr. Mike Lumpkin joined remotely via videoconference. The session lasted about 15 minutes. Workers asked about fugitive emissions and odors outside of the tank farm fence lines.
- **October 31, 2018:** Dr. Lumpkin held a session with about 35 workers that lasted about 20 minutes. He was asked to compare the level of IH practice (both hardware, processes, and air sampling and monitoring) that CTEH has observed at Hanford with programs around the country implemented at commercial chemical plants and petroleum refineries. Another question was raised as to whether CTEH had analyzed any monitoring data from the recent grout steam release at one of the PUREX facility tunnels. Dr. Lumpkin also discussed the concepts of real-time monitoring for VOCs, and he met with individual workers after the session to talk about real-time ammonia stack data as well as CTEH experience with supporting risk communication with workers exposed to odors and combustion by-products in the commercial railroad industry.

The Data Access Visualization Tool

Since the Data Access and Visualization (DAV) tool was launched in October 2017, data from the more than one hundred thousand chemical samples from IH Sampling has been logged into the Site Wide Industrial Hygiene Database (SWIHD). During 2018, WRPS worked with PNNL on the second-generation DAV tool, the goal of which was to enhance its capabilities to include the next iteration of data generated by the Vapor Monitoring and Detection System (VMDS). The VMDS equipment is capable of testing air samples 24 hours a day, 7 days a week, providing a detailed look at which chemicals exist in which farms, the levels of each chemical, and in close to real-time. The workforce participated in the development of the tool. Their suggestions on ways to improve the tool's effectiveness were successfully tested and reviewed by management. The enhanced DAV tool will go live after the stack monitors have been turned over to Operations.

Integrated Sampling & Monitoring Strategy

IH has established the scope and purpose for the IH 200 Areas Surveillance Strategy and briefed the Office of River Protection (ORP).

ToxiRAE Implementation

IH purchased ToxiRAE Pro personal ammonia sensor units for use in the field in FY 2018. The ToxiRAE Pro detectors will be rolled out into the field in FY 2019. Compact, reliable and easy-to-use, the ToxiRAE Pro is a portable, continuous single-gas monitor with alarming capabilities to warn workers of a change of conditions within the tank farms so they can take actions to ensure they are not overexposed to tank farm vapors. Used in conjunction with administrative controls, access controls and engineering controls, the ToxiRAE Pro has a personal alarm typically set at 6 parts per million (ppm) ammonia, about one-quarter of the occupational exposure limit (OEL). The alarm sounds if ammonia concentration reaches 6 ppm, at which time the workers will follow the prescribed response actions. The 6-ppm set point was determined based on data collected over several years and various conditions to ensure a conservative and protective response. The devices will be used initially for Risk Classification (RC) -1 and RC-2 work in actively ventilated tank farms. ToxiRAE Pros are being piloted in SY Farm to work through the details of implementation and will be rolled out to other farms in the near future. (*As reported by Solutions, Issue 457, October 22, 2018.)*

Root Cause Analysis

A vapors-related Root Cause Analysis (RCA) team was formed in October 2018 to review reports and evaluations of vapors at Hanford prepared by external industry and government experts, and to determine underlying causal factors. The team includes the following:

- Killoy, Steve E, Manger, Chemical Protection Integration
- Torres, Alex, Contractor Assurance (RCA Team Lead)
- Way, Kenneth J, Manager, Industrial Hygiene
- Brown, Robert L, Contractor Assurance
- Gagnon, Paul A, TFP Project Management
- Graham, Pete, IHT Safety Representative, ESH&Q
- Hadley, Ryan M, Performance Assurance, Production Operations
- Holst, Chris S, Chemical Protection Program Office (CPPO)
- Kind, Dr. John, Principle Toxicologist, CTEH
- Lee, Christopher J, Vent & Balance Operations, Central Operations
- Lumpkin, Michael, Senior Toxicologist, CTEH
- Park, Richard, Safety Representative, ESH&Q (INDEY)

- Peoples, John G, IHT Safety Representative, ESH&Q
- Riedner, Kirk E, CPPO
- Rodriguez, Andres, Safety Representative, ESH&Q (INDEY)

The final report is scheduled for release by the end of calendar year 2018.

2. Mitigating Actions/Engineered Controls

AW and AN Stack Extensions

At the beginning of FY 2018, the AW Farm Exhauster scope was to extend the stack's current elevation from 27 feet to 60 feet by the end of FY 2018. Because of issues identified during the permitting review process, the schedule for completing the AW Stack extension was stretched out until FY 2019. The goals for FY 2019 are to complete the field installation and turn the stack over to operations. Below is a summary of what was accomplished in October:

- **Stack Installation:** Fabrication of the stack extension was completed in October with plans to deliver to the site in November. The final installation of the extension will not be completed until the non-radiological and radiological permits have been approved.
- **Permitting:** During October, efforts continued on preparing permits. The radiological permit is currently with the Department of Health for review, while the non-radiological permit is with the Department of Ecology for review.

A Farm Exhausters

In FY 2018, construction of the concrete pad was completed. The goals for FY 2019 are to complete installation of the exhausters, exhauster valve manifold component and all ventilation cold tie-in components. Below is a summary of what was accomplished in October:

- **Exhausters:** Completed installation of the exhausters **(Figure 2)**.
- **Exhauster Valve Manifold:** Completed valve manifold slab forms, rebar installation and placing concrete for the exhauster valve manifold pad.
- **Procurement/Fabrication:** Completed fabrication of the pit work platform and cover plates, and started fabrication of the ducting weldments, duct stand assemblies, and large spray rings.

Figure 2. Installation of two exhausters in A Farm. (Photo courtesy of Solutions, Issue 458.)

NUCON®[1]

In FY 2018, an engineering-scale test of the NUCON® Vapor Abatement Unit (VAU) was performed. The current goals for FY 2019 are to start the detailed design of the next generation VAU and tank farm infrastructure, and to apply for environmental permits, as necessary. This is a collaborative effort between WRPS, PNNL, TerraGraphics, and NUCON®. Below is a summary of what was accomplished in October:

TerraGraphics:

- Issued the conceptual design of the NUCON® infrastructure for the field demonstration at BY 108.
- Initiated work on the 30% design package.
- Issued a purchase order for an instrument trailer.

NUCON®:

- Continued to provide telephone consulting.

WRPS:

- Identified and resolved a work scope issue with the PNNL contract.
- Started review of final specifications for both the TerraGraphics and NUCON® design products.

- **PNNL**:
  - Began isolation and demobilization of the NUCON® VAU used to support the engineering-scale test.
  - Received the results of off-line samples taken during the engineering-scale test and compared them with on-line results.
  - Completed the first draft of the *NUCON® Vapor Abatement Unit Performance on Hanford Tanks Farm Chemicals of Potential Concern* report. That report will include a review of the off-line sample results.

Strobic®2 Air Tri-Stack

FY 2018 saw completion of both the factory acceptance test and full-scale off-site demonstration test. October efforts focused on planning the details for FY 2019 activities.

AP Farm Ultra Violet Fourier Transformer Infrared Spectrometer

In FY 2017, WRPS identified VMDS components for use in the tank farms, one of those being the ultra violet Fourier Transformer Infrared Spectrometer (UV-FTIR). The main goal for FY 2018 was turnover of the AP Farm stack monitor (UV-FTIR) to Operations. Because of issues identified during the testing process, the schedule for completing the activity was stretched out into FY 2019. The goal for FY 2019 is to complete turnover of the AP Farm UV-FTIR to operations. Below is a summary of what was accomplished in October:

- **Operational Acceptance Tests (OAT)**: A number of OATs are being prepared in support of turnover activities. 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, while the third OAT addresses startup activities where gas testing is required. A status for each OAT is provided below:
  - **Interim Reliability OAT:** Software modifications were completed and the OAT was re-started.
  - **No-Gas Testing OAT:** The OAT is currently awaiting final approvals.
  - **Gas Testing OAT:** The draft OAT is being prepared and is targeted for approval in the near future.

Auto Sampler

Modification of the Real-Time Detecting, Optimized-Sample-Selection (RDOSS) system (hitherto called the Autosampler) for stack monitoring was performed in FY 2018. The RDOSS is fitted with a gas chromatograph flame-ionization detector and Ultra Violet- Differential Optical Absorption Spectrometer (UV-DOAS); this unit provides real-time analysis of easily detectable indicator COPCs (e.g., NH3 and mercury), an hourly analysis of a suite of COPCs, and can also collect targeted laboratory samples for analysis that will provide more accurate detection and characterization of Hanford COPCs. Towards the middle of FY 2018, the development of the autosampler was deferred until FY 2019. October efforts focused on preparing and releasing contracts needed to support FY 2019 activities.

Stack Monitor Turnover/VMDS Upgrade

In FY 2018, VMDS stack monitors were installed on the AW, AX (2), AN, and 702-AZ exhausters. The goal for FY 2019 is to turn over all the monitors to operations. Below is a summary of what was accomplished in October:

- **General:** Started preparing contracts needed to support development of set-point calculations.
- **AX Farm Stack Monitors:** Started preparing the draft test plan needed to support the interim OAT, and started preparing the test matrix for software development.

Public Address System

FY 2018 saw the installation and turnover of public address (PA) systems for all west and east area tank farms. The focus in FY 2019 is to install all reader boards associated with the PA system, followed by integrated testing of the entire system. In October, excavation of the sites where the reader boards are to be located was started, the concrete foundations were placed and backfill was performed **(Figure 3)**.

Figure 3. Excavation for the Public Address System Reader Board (Photo courtesy of L. Parks-Beyer.)

SST Farm Automation

The purpose of the single-shell tank (SST) Stewardship Program is to identify and evaluate procedures requiring entry into SSTs and determine whether those requirements can be eliminated or reduced. Activities in FY 2018 consisted of completing design packages needed to support the installation of the remote monitoring equipment in both TY Farm and TX Farm, developing and issuing a plan for implementing feasible recommendations from the FY 2015 LEAN event focused on reducing tank farm entries, and issuing a report on work location evaluations. The goals for FY 2019 are to install the remote monitoring equipment at both TY and TX Farms with turnover to operations. Below is a summary of what was accomplished in October:

- **SST Remote Monitoring Equipment:** An engineering support contract for the SST Automation Project was awarded to Veolea Nuclear Solutions (VNS). VNS started performing design validations in TX/TY Farm on the liquid-level communication-loop, a device that will allow the liquid-level device to be controlled remotely outside the farm. In addition, procurement efforts were initiated during the month.

- **T-Complex Field Construction:** Efforts are ongoing to develop the statement of work for the T-Complex construction (installation) award.

FFAPR and PAPR

Beginning as early as Tuesday, May 22, 2018, workers in AP Farm had the option of using full-face air-purifying respirators (FFAPRs) equipped with filter cartridges for low-hazard non-waste-disturbing work in the AP Tank Farm rather than supplied-air respirators such as self-contained breathing apparatus (SCBA). During the 3rd Quarter, IH began developing hazard assessments for RC 1 & 2 work in the ventilated farms. WRPS began the work package to support PAPR testing in BY-108. All six cartridge tests were completed; the last two tests on the AW Stack were completed by June 9, 2018. On June 25, WRPS updated TFC-PLN-168, *Industrial Hygiene Sampling and Analysis Plan for Respirator Cartridge Testing*, to incorporate Wastren Advantage Incorporated, Hanford Laboratory (WHL) specific analysis procedures. SCBA chest straps on order arrived during the 3rd Quarter. Air Purifying Respirator (APR) and Powered air purifying respirator (PAPR) cartridge testing, the last of the cartridge testing for FY 2018, was completed at the AW Farm primary exhaust stack during the transfer of AW-106 to AW-102. In September 2018, PNNL sent to WRPS for review, PNNL-27860, *Analysis of Air-Purifying Respirator (APR) and Powered Air-Purifying Respirator (PAPR) Cartridge Performance Testing on a Hanford AX Tank Farm Exhauster Slipstream, Volumes 1 and 2.*

3. Information Sharing/Communication

Chemical Vapors Solution Team (CVST) Meetings

CVST Sub-team Meetings in October 2018

- **Communications Sub-team**
  October 29, 2018
  The purpose of the CVST Communications sub-team meeting is to provide general vapor and sub-team product update, outreach, and presentations to other Hanford site contractors.
  A question was brought up about the number of AOP-015 events that originate from outside the tank farms and why the workforce was not educated on making decisions (e.g., whether to don PPE in those areas) about them. The Communications lead said he would relay this question to management for review.
  A question was brought up in regards to the process for downgrading Personal Protection Equipment (PPE) (e.g. crews supporting the SX Farm asphalt barrier were not required to wear SCBA) and why this could not be site-wide. The IH professional in attendance provided an overview of the Alternative Respiratory Protection Assessment (ARPA) form used to downgrade PPE and said it was determined that it was safer for the crews to apply the asphalt without wearing SCBA. Furthermore, it was mentioned that the ARPA process could be used by all organizations. A status was also requested on the use of PAPR instead of FFAPR, which was provided.
- **New Technology Sub-team**
  No meeting was held in October.
- **Fugitive Emissions Sub-team**
  October 17, 2018
  The mission of the Fugitive Emissions CVST Sub-Team is to investigate documented incidents of planned chemical releases (i.e. cribs, ditches, and evaporation ponds), as well as investigate reports of unplanned chemical releases with the goal of identifying, locating, and characterizing emissions to the site and its workers. In FY 2018, the sub-team selected 4th and Buffalo as the first site to be investigated. Small group meetings were established with workforce representatives (including operations, IHTs, and sampling) to ensure worker feedback / input was provided to the process, and to capitalize on the sampling and characterization knowledge of the workforce.

The October meeting statused activities and discussed the path forward. Representatives from CTO, IH Programs, IH Field Operations, ORP, PNNL, WRPS Project Management, WRPS Health and Safety, WRPS Process Engineering, Operations and HAMTC attended. An overview of FY 2019 activities was offered. The majority of the meeting focused on discussing FY 2018 preliminary investigations, which consisted of determining the sources of potential odors (i.e., fingerprinting). Investigations not only included the 4th and Buffalo area, but off-site areas such as agricultural and onion processing operations. The last part of the meeting discussed FY 2019 work, which will be accomplished in two phases. The first phase will be to complete the 4th and Buffalo investigation and the second phase will be to initiate focused sampling in the areas of interest. Numerous questions and feedback were provided throughout the meeting.

- **Chemical Cartridge Sub-team**
  Meetings were held on October 3, 2018, and October 17, 2018.

HanfordVapors.com Metric

Figure 4 shows that the Hanford Vapors website logged over 2,711 views in October 2018, marking a seventeen percent (17%) increase over September. In October, the website experienced an average of 90 hits-per-day, which is slightly below the average for FY 2018. Website traffic was elevated on October 22, which is when the IHT Workspace and Training Notebook was presented as part of the Safety Start presentation. Communications and Public Relations (C&PR) reported posting the following 11 items to the site this month:

- CPPO Weekly Report – September 13, 2018
- CPPO Weekly Report – September 20, 2018
- CPPO Weekly Report – September 27, 2018
- CVST Meeting Agenda – September 5, 2018
- CVST Meeting Agenda – October 10, 2018
- FAQ – September 20, 2018
- NUCON New Landing Page and Image
- PNNL-27816 NUCON Report
- PNNL-27816 NUCON Report Summary
- Odors Reported Outside of AP Farm – October 5, 2018
- Odors Reported Outside of U Farm – October 24, 2018

Figure 4. Hanford Vapors Website Metric

CPPO Notebook Metric

The CPPO Notebook assists managers in providing vapor-related information to their staff. It is delivered on a weekly basis in multiple formats: a 'One-Sheet' summary of the weekly topic, a PowerPoint presentation (with speaker notes), and a video narrated by a technical expert. Four CPPO Notebooks were distributed in October:

- ToxiRAE ammonia monitor
- Air monitoring results from the 242-A Evaporator Campaign (EC-08)
- An update on the new IH workspace and IH training
- Tank Farms Event Notification System

Managers are asked to reply "Yes" to their email when they intend to use the Notebook with their staff. Often, the Notebook is utilized weeks after it was distributed. Consequently, the data frequently changes over time. The data is updated monthly.

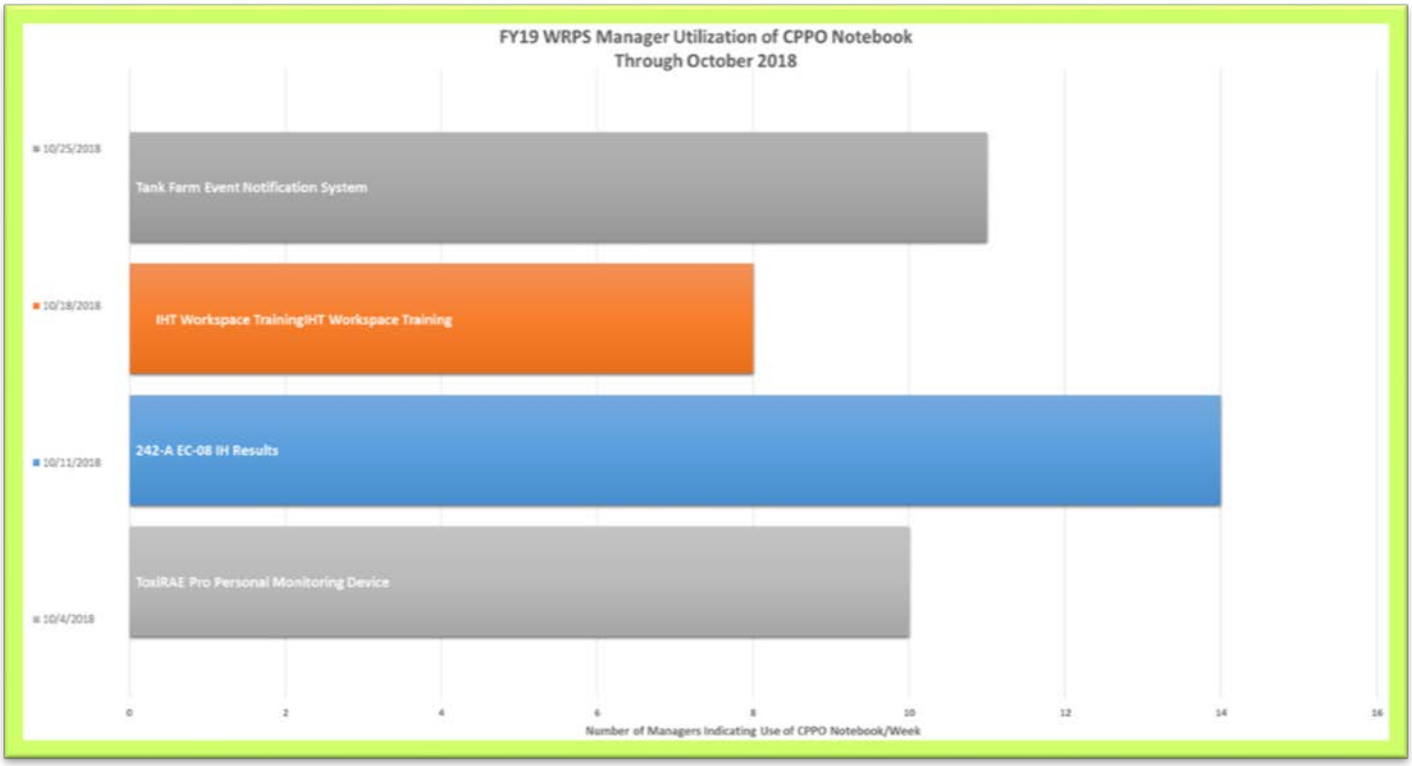


Figure 5. FY 2019 WRPS Manager Utilization of CPPO Notebooks

In October, an average of 11 managers a week reported using the *Notebook*. **Figure 5** shows which *Notebooks* were used by WRPS managers, and when each *Notebook* was used. Since the beginning of FY 2019, WRPS managers reported utilizing the *Notebooks* 43 times.

The notebook material is provided in multiple formats, including an SME narrated/video presentation posted to the intranet, and available to all WRPS staff. **Figure 6** shows the monthly website traffic statistics for visits to the CPPO Multimedia Library since the beginning of the fiscal year. The data suggests a larger reach than that which is self-reported by the management distribution list. In October, narrated *Notebook* files were accessed 345 times. There were two *Solutions* articles and four *Notebooks* released in October.

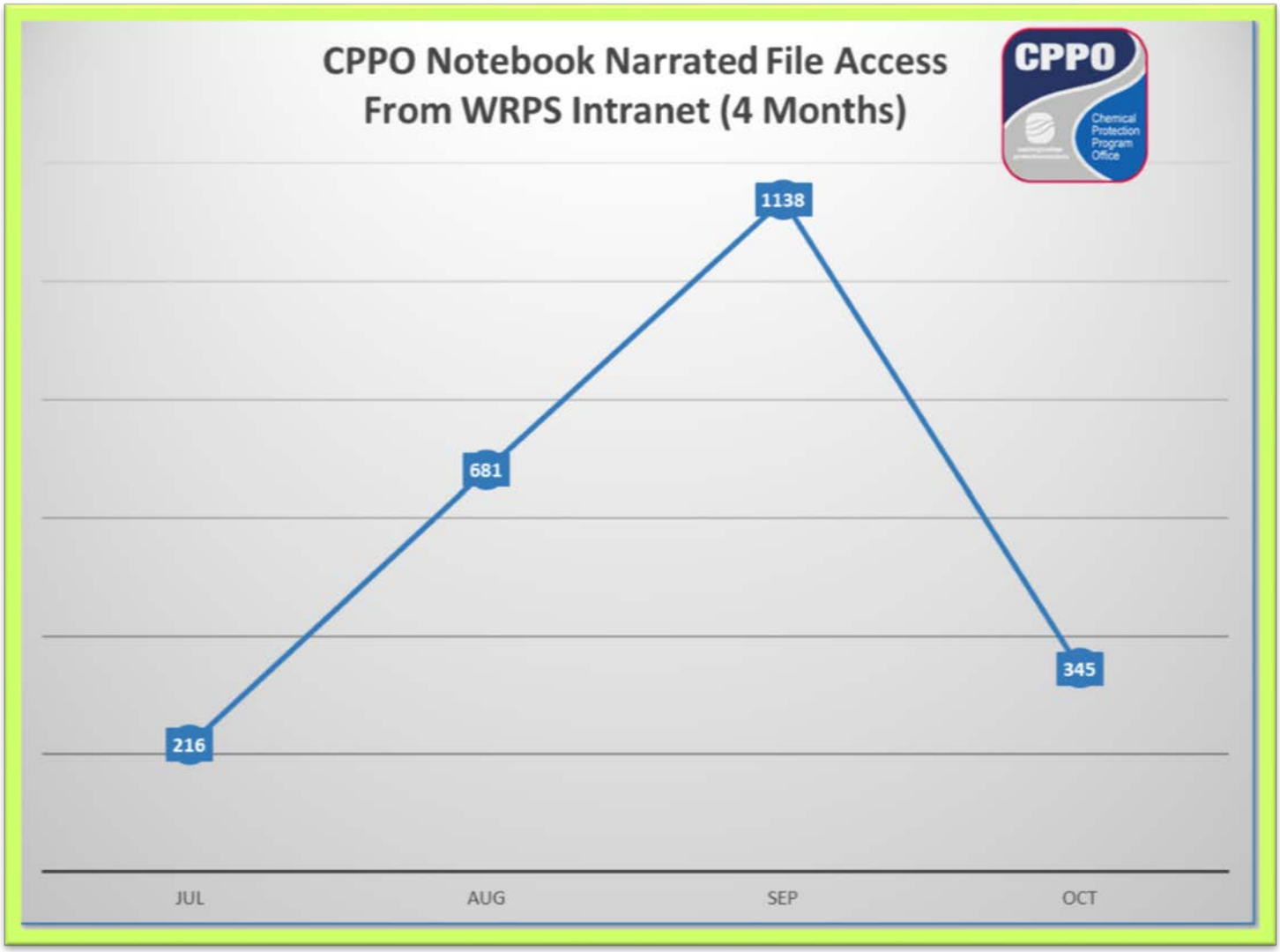


Figure 6. Narrated File Access of CPPO Notebook from WRPS Intranet – 4

CPPO Production Metrics

The CPPO provides monitoring results, report summaries, presentations, and a monthly report on WRPS vapors activities to the workforce. *Solutions* newsletter, the HanfordVapors.com website, the internal vapors website, and direct emails are the primary distribution paths of the CPPO products. The vapor-related materials produced by the CPPO in October are shown in **Table 1.** In October, the CPPO produced and provided one annual report, four report summaries, one focus group report, and six worker engagement activities. In addition, four *CPPO Notebooks* were delivered to the workforce.

Table 1. CPPO Vapors Information and Engagement Activities FY 2019

CPPO Vapors Information and Engagement Activities FY19	October	FY-to-Date Total
Presentations (includes CPPO Notebook and CVST)	**4**	**4**
CPPO Reports and Monthly/Quarterly/Annual Report	1	**1**
Articles, Summaries, and Message Maps	4	**4**
Surveys, Focus Groups, and Recommended Actions	1	**1**
Website Requests/Site Updates	10	**10**
Videos	0	**0**
Field Visits	**3**	**3**
Chem. Worker Training Support	3	**3**
Monthly Totals	**26**	**26**

Table 2. WRPS Vapors Information Distribution Avenue – FY 2019

WRPS Vapors Information Distribution Avenue	October	FY-to-Date Total
All Employee Email/Meetings & ESHQ Comm.	7	**7**
CPPO Notebook•	43	**43**
CPPO Report and Weekly Report	1	**1**
Fact Sheet & Information	0	**0**
Meeting - CVST •	1	**1**
Meeting - CVST Sub-team meeting •	1	**1**
Meeting - Hanford Advisory Board Briefing •	0	**0**
Meeting/Briefing•	5	**5**
Meeting -Morning/Pre-Shift Brief•	437	**437**
Presentation•	0	**0**
Safety Start	2	**2**
SOEN	2	**2**
Solution Article	3	**3**
Survey and Focus Group	0	**0**
Tours•	0	**0**
Vapors Weekly Update or Website Post	11	**11**
Video	0	**0**
Monthly Totals	**513**	**513**

The total number of documented WRPS vapors-related communications provided to the workforce in FY 2019 is shown in **Table 2.** The data for October shows a modest increase in the otherwise steady rate of around 500 vapors-related communications per month. Plan-of-the-Day (POD) meetings remain the primary source of vapors-related information provided to the workforce, followed by utilization of the *CPPO Notebook*.

WRPS Vapors Communications

October 3, 2018, Industrial Hygiene Communication:
Subject: SY, AP, and AN Tank Farm FFAPR Use Update
"Full Face Air Purifying Respirators (FFAPR) was authorized for low-hazard work (Risk Classification [RC] 1 and RC 2) in SY, AP, and AN Tank Farms in December 2017, June 2018, and September 2018 respectively."

October 4, 2018, All WRPS employees email:
Subject: "Odors reported at AP Farm"
"Two Hanford workers declined precautionary medical evaluation this morning after reporting odors at AP Farm. The employees were monitoring farm conditions from the AP Farm instrument building. They were not in an area that requires use of a supplied-air respirator. Workers were instructed to leave the area, and access to the area was restricted."

October 4, 2018, Hanford Vapors:
Subject: None
"Two Hanford workers declined precautionary medical evaluation this morning after reporting odors at AP Farm. The employees were monitoring farm conditions from the AP Farm instrument building. They were not in an area that requires use of a supplied-air respirator. Workers were instructed to leave the area, and access to the area was restricted."

October 8, 2018, Solutions, Issue 455:
Subject: "222-S Lab completes HVAC upgrade"

Subject: "CPPO *Notebook* published on ToxiRAE"

October 9, 2018, Industrial Hygiene Communication:
Subject: "FFAPR Path forward"
WRPS is actively working with SCOTT and NIOSH to resolve the carbon dusting issue associated with the SCOTT full-face air purifying respirator (FFAPR) cartridges. In addition, we have been working with the third party independent cartridge testing experts, Stoneturn Consultants (STC) on the issue. STC has recommended WRPS consider filter cartridges from

other manufacturers, if the manufacturer can supply breakthrough data for ammonia at various concentrations, temperatures and humidity levels. We have been in contact with MSA and are working with them and STC to gather the necessary data to determine if we can move forward with MSA full-face respirators. We were planning to continue the rollout of FFAPR use to the remaining actively ventilated farms starting Tuesday October 16, 2018. Unfortunately, we are having to postpone the rollout until we resolve the issue with carbon dusting from SCOTT brand respirator cartridges or identify an alternative manufacturer.

October 11, 2018, Industrial Hygiene communication:
Subject: "Monthly Routine Testing Results – Chemical (Anions) and Bacterial Testing – Respiratory Protection Equipment and Surfaces"

October 22, 2018, Solutions, Issue 457:
Subject: "ToxiRAE Pro selected by IH for ammonia monitoring"
Subject: "CPPO *Notebook* published on results of air monitoring during evaporator campaign"

October 24, 2018, Shift Office Emergency Notification (SOEN) 9:17 am:
Subject: "Significant Operational Issues"
"Entered AOP-015 for odors reported outside of U Farm, access to U Farm from 16th St. is restricted."

October 24, 2018, SOEN 10:44 am:
Subject: "Significant Operational Issues"
"Sample analysis for the TF-AOP-015 event has been completed and the results are at or below background levels. Exiting TF-AOP-015."

October 24, 2018, All WRPS employee email:
Subject: "Odors reported outside U Farm"
"Six Hanford workers declined precautionary medical evaluation this morning after reporting odors outside the U Tank Farm."

October 24, 2018, Hanford Vapors:
Subject: "Odors reported outside U Farm – Oct. 24, 2018"
"Six Hanford workers declined precautionary medical evaluation this morning after reporting odors outside the U Tank Farm."

October 30, 2018, Industrial Hygiene communication:
Subject: "New Standard – TFC-ESHQ-IH-STD-07, Respiratory Protection"

"WRPS has an updated Respiratory Protection Program that went into effect this week."

Engagement/Site Visits

Early in FY 2018, CPPO completed an employee vapors information effectiveness survey, which found that a majority of the workforce were either unaware of CPPO's job scope or unaware of some of the vapors-related information available. In reviewing the survey results at a CPPO/HAMTC interface meeting, it was suggested that CPPO visit the WRPS teams to educate the workforce about CPPO. A dozen teams on site hosted CPPO during plan-of-the-day and morning shift meetings. This workforce engagement activity is a FY 2019 CPPO priority, and will be reported on in the Monthly Report.

CPPO SMEs routinely engage with groups of workers face-to-face to inform them on the latest tank vapors communications efforts as well as to answer worker questions related to the mitigation of health risks and concerns related to tank vapors exposures.

- During the week of October 5, Dr. Chris Kuhlman met with IH supervisors and other IHs in 2704HV. They discussed ongoing APR analysis by Stoneturn, Scott, and PNNL. They also discussed the ToxiRAE ammonia monitors and workers' questions about the instruments' alarm set points, action levels, and OELs.
- During the week of October 12, Drs. Chris Kuhlman and Angela Perez met with workers at the AP-103 jumper repair pre-job, where they discussed factors of the work that could result in potential vapor exposures. The toxicologists also met with a group of HAMTC safety reps, where a discussion was held regarding FFAPR filter cartridge dust releases.
- Dr. Mike Lumpkin was onsite the week of October 29, when he attended a pre-job meeting and visited the change trailers at the BY Farm. An issue arose in which rubber pipes used to exhaust electrical generator exhaust were emitting burnt rubber-like odors. The project IHTs and Dr. Lumpkin together explained to workers that volatile compounds coming from the pipes could be smelled at levels much lower than the direct-reading instrument's detection limit, but were present at levels thousands of time lower than levels that would affect health.

In October, the CPPO team visited the 222-S lab. Five people attended. A very interactive Q&A session and feedback session occurred. The 222-S workers were very impressed with the layout of both the Vapors

Protection and CPPO websites (i.e., it was easy to find information). There were also discussions on technology development (i.e., NUCON, Strobic) and insight into how vapors affects 222-S personnel.

Focus Groups/Surveys

The *FY 2018 WRPS Vapors-Information Worker Focus Group – Report Summary* was issued in October, and can be found on the internal website. The focus group's participants were Hanford Tank Farm field workers, the segment of the workforce most affected by chemical vapors. Participation was voluntary and specific responses are confidential. An action plan has been developed to implement many of the recommendations, one of which was to include external references where appropriate in the *Notebooks*. Another recommendation was to highlight the professional expertise of the technical staff who prepare and narrate the *Notebooks*.

To evaluate the effectiveness of vapor information resources to first line supervisors, CPPO will lead focus groups in FY 2019.

In October, the CPPO published the *Tank Operations Contract Chemical Protection Program Office Fiscal Year 2018 Annual Summary*. The report tracked the status of the CVAP KPPs. It can be found here.

In October, a new report format was developed for FY 2019 that realigned the information from reporting on CVAP KPPs to support the 'outcomes' of the CVAP. This approach will facilitate telling the integrated approach to chemical vapor hazard control.

AOP-15 Events

On October 5, 2018, *Hanford Vapors*, and an *All WRPS Employee Email* reported, "[t]wo Hanford workers declined precautionary medical evaluation this morning after reporting odors at AP Farm. Neither reported symptoms. The employees were monitoring farm conditions from the AP Farm instrument building. They were not in an area that requires use of a supplied-air respirator. Workers were instructed to leave the area, and access to the area was restricted. Industrial hygiene technicians gathered samples in the area. None of the monitoring and sampling results exceeded the action level for any chemical detected. Access to the area has been restored."

On October 24, 2018, *Hanford Vapors*, and an *All WRPS Employee Email* reported, "[s]ix Hanford workers declined precautionary medical

evaluation this morning after reporting odors outside the U Tank Farm. None reported symptoms. The employees were performing maintenance on electrical distribution equipment. They were not in an area that requires use of a supplied-air respirator. Workers were instructed to leave the area, and access to the area has been restricted. Industrial hygiene technicians gathered samples in the area. None of the monitoring and sampling results exceeded the action level for any chemical detected. Access to the area has been restored."

External Assessments Recommendation Status

By the end of FY 2018, 371 vapors-management recommendations had been identified from third party assessors. Eighty-three (83) recommendations had been completed by the end of FY 2017, 63 of which were from the original TVAT report. Throughout FY 2018, the recommendations were tracked and statused under the following criteria:

- **Complete** - The scope and deliverable(s) (i.e. final report or documentation) addressing the recommendation is complete and closed. CPPO validated the deliverable(s) as complete.
- **Field Work Complete** - The scope addressing the recommendation is complete, but the final deliverable(s) is not complete (i.e. final report or documentation).
- **In Progress** - The scope addressing the recommendation is in progress.
- **Pending Validation** - Status of the scope addressing the recommendation and associated deliverable(s) is awaiting initial CPPO review.

Significant progress has been made to address the recommendations. CPPO validated ninety-four (94) percent of the recommendations are Complete or Field Work Complete. The status of the recommendations is listed below:

- Eighty-one (81) percent have been verified **Complete** and are considered closed.
- Thirteen (13) percent have been verified as **Field Work Complete;** documentation is required to close.
- Six (6) percent have ongoing actions and are **In Progress**.
- Zero (0) percent are **Pending**.

Report	As of October 31, 2018				
	Total	Validated Complete	Field Work Complete	In Progress	Pending
TVAT	117	99	10	8	0
OIG	3	3	0	0	0
NIOSH	54	41	9	4	0
EA-32	31	26	1	4	0
CTEH	24	22	1	1	0
VMEP I, II	67	59	6	2	0
Other	75	52	20	3	0
Total	371	302	47	22	0

External Assessments Recommendations Status

Figure 7. External Assessments Recommendations Status Table

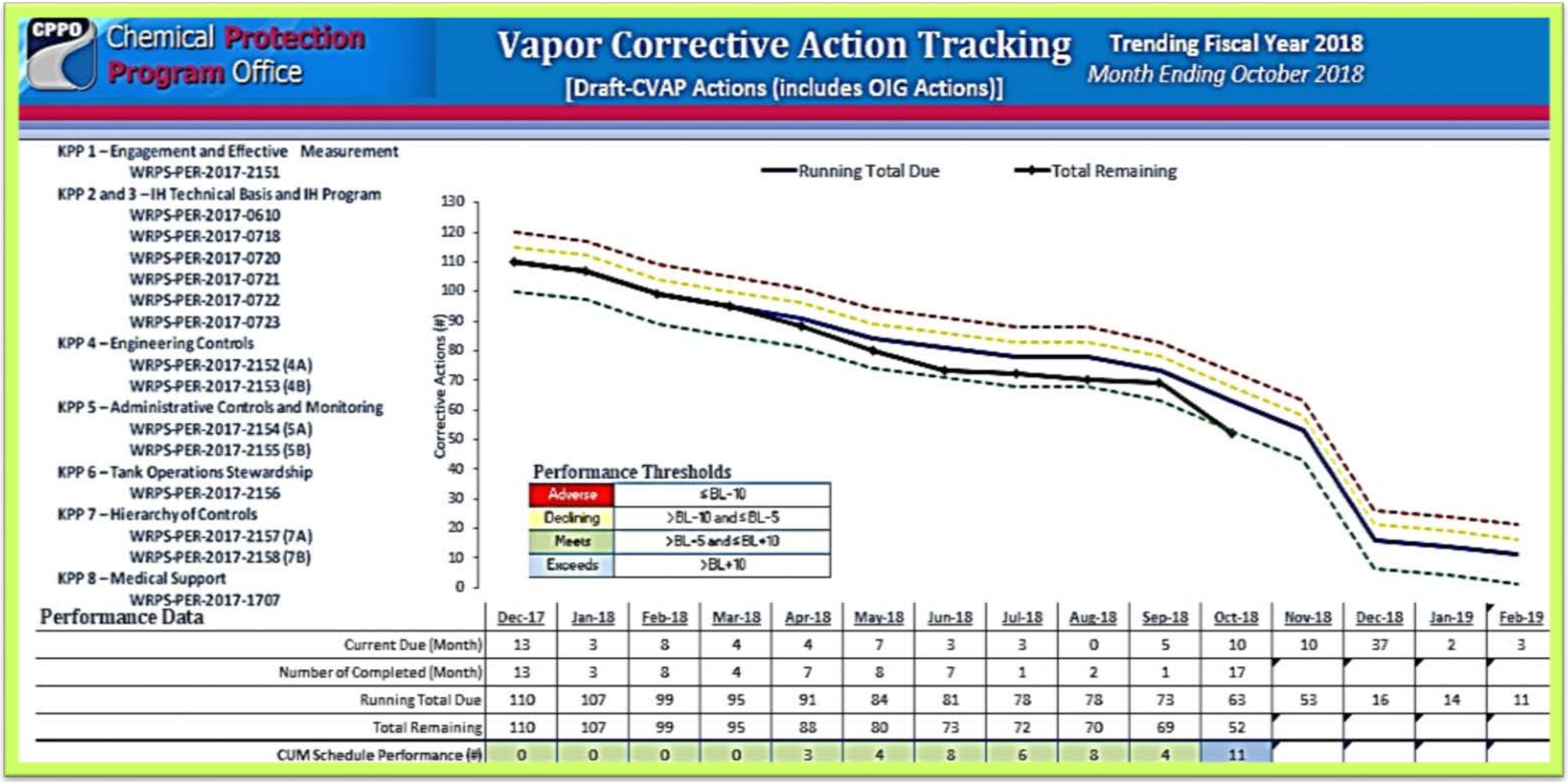
CVAP Corrective Actions Tracking Metric

The CPPO tracks vapor-related Problem Evaluation Requests (PER), with the goal of communicating PER resolution status. The performance data in **Figure 8** below are defined as follows:

- **Current Due** – Current corrective actions due for the month
- **Number of Completed** – Number of corrective actions completed for the month
- **Running Total Due** – Total cumulative actions scheduled to be completed
- **Total Remaining** – Total cumulative actions remaining to be completed
- **Cumulative Schedule Performance** – Total cumulative actions to be completed to the Running Total Due

The 128 draft CVAP actions are captured in the PERs listed in **Figure 8** below, including the three Office of Inspector General (OIG) actions captured in WRPS-PER-2016-2433 thru 2435 and 4 Office of River Protection (ORP) Facility Representative Surveillance (17173-TF) actions captured in WRPS-PER-2018-0551 thru 0554. Sixty-three TVAT actions were completed during Phase I (FY2016) and the OIG actions were

completed in FY2017; its completions are documented in the Electronic Suspense Tracking and Routing System (E-STARS). The remaining TVAT actions have been rolled into the CVAP. The remaining recommendations from National Institute of Occupational Safety and Health (NIOSH), EA-32, CTEH, and the VMEP were added to the PER system and corrective actions launched. **Figure 8** depicts the status of the draft CVAP total corrective actions and shows that 17 actions were completed in October, for a total of 11 actions being completed early over the past 12 months. In addition, approximately 45% of the total CVAP actions were completed in FY 2018 and of the remaining open actions, approximately 85% are scheduled to be completed in the 1st Quarter of FY 2019.



Performance Data

	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19
Current Due (Month)	13	3	8	4	4	7	3	3	0	5	10	10	37	2	3
Number of Completed (Month)	13	3	8	4	7	8	7	1	2	1	17				
Running Total Due	110	107	99	95	91	84	81	78	78	73	63	53	16	14	11
Total Remaining	110	107	99	95	88	80	73	72	70	69	52				
CUM Schedule Performance (#)	0	0	0	0	3	4	8	6	8	4	11				

Figure 8. Vapor Corrective Action Tracking

4. Sampling and Monitoring

Mobile Lab

At the end of FY 2018, TerraGraphics had completed building the new mobile laboratory. The new mobile laboratory features enhanced capabilities, including a more sensitive PTR-MS, UV-DOAS, Fourier transform infrared spectrometer, Flame Ionizing Detector, Photo Ionizing Detector and a Picarro ammonia analyzer. Tours of the new Mobile Laboratory were conducted at the 3110 Port of Benton building parking lot. Activities performed by the new mobile laboratory include the following:

- Area monitoring support for the AY-102 Rinse Evolution
- Sampling around the SX tank farm during initial activities associated with the paving project
- Supporting the Fugitive Emissions initiative:
  - Sampled around the septic tanks located near the 242-A evaporator
  - Sampled downwind of the septic tanks, near 244-AR
  - Sampled in the vicinity of a local onion producer

Cartridge Test Reports

Cartridge testing, to support efforts for the switch to full-face air purifying respirator (FFAPR) in the farms, was completed during FY 2018. The results of the testing were presented to the third party reviewers, Stoneturn Consultants, for review and comment. The review allowed the implementation of FFAPR in the double shell farms with the tested cartridges, but due to issues with facial charcoal dusting, the use of FFAPR is now under a stop work.

222-S Lab Capabilities

Almost all instrument systems have been restored to service. Vapor analysis for furans and volatile organic analytes (VOA) has resumed. Semi-VOA analytical instruments are in calibration/trouble shooting mode, and non-tank organics are being analyzed.

ToxiRAE Monitoring Data

As part of the phased roll out of the ToxiRAE, monitoring data is not being captured or being placed in the SWIHD at this time. Monitoring data will be captured in future phases.

[1]NUCON is a registered trademark of Nucon International, Inc., Columbus, Ohio.
[2]Strobic Air Tri Stack is a registered trademark of Strobic Air Corporation, Bensalem, Pennsylvania.