washington river protection solutions

WRPS Integrated Chemical Vapor Hazard Control Program

2nd Quarter Summary

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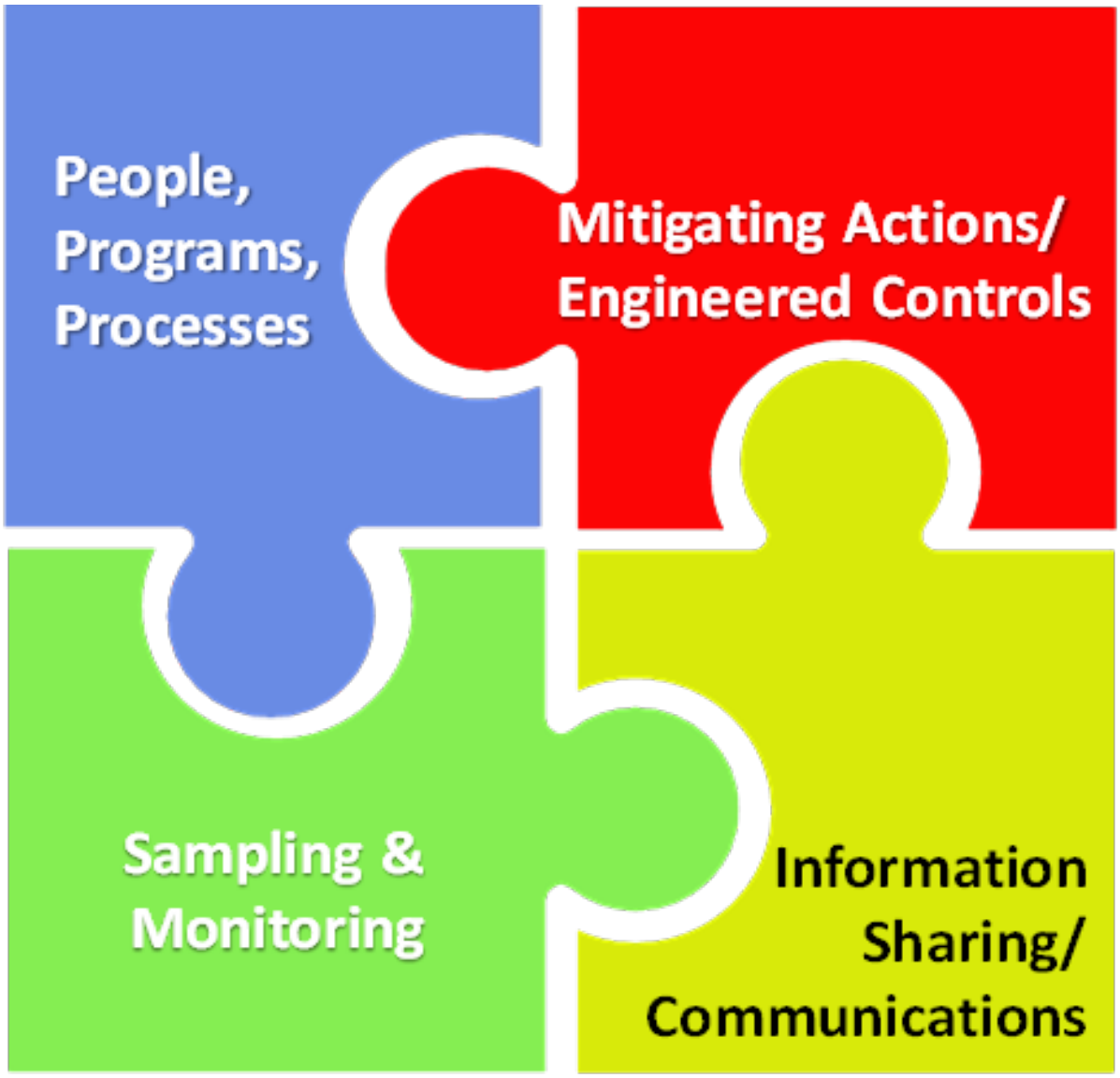


At the end of Fiscal Year (FY) 2016, Washington River Protection Solutions LLC (WRPS) was completing Phase I of the *Implementation Plan for Hanford Tank Vapor Assessment Report Recommendations* (WRPS-1500142), developed to address Tank Vapors Assessment Team (TVAT) recommendations. The implementation 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 and 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 and/or Quarterly Report.*

1. People, Programs, Processes

"People, Programs, and Processes describes actions to ensure employees are qualified and trained, processes are in place to perform work safely, and programs are developed and updated."

Exposure Assessments

2nd Quarter Summary:

IH and the Office of River Protection (ORP) agreed to a new Exposure Assessment (EA) review process in January. No longer do exposure assessments require an ORP review prior to publication. Content-only reviews will be conducted post-publication and any necessary edits will be incorporated in subsequent revisions. The *Exposure Assessment for SY Farm* is nearing completion and will enter into the review process in early April.

IH Training

2nd Quarter Summary:

IH reported that 78 percent of IHTs had completed a *ToxiRAE Pro Laboratory Preparation & Calibration Training* by the end of February, and 100 percent by the end of March. Approximately 90 percent of IHTs had completed *ToxiRAE Pro Field Use Training* for all On-the-Job Trainer /On-the-Job-Evaluator (OJT/OJE) Qualified IHTs by the end of the 2nd Quarter.

Health Process Plan (HPP) and Charter 71 (TFC-CHARTER-71)

2nd Quarter Summary:

The following four HPP reports (also known as Charter 71 reports) were further developed by Pacific Northwest National Laboratory (PNNL) and WRPS during the 2nd Quarter:

- ***Hanford Tank Farm Occupational Exposure and Risk Assessment Plan*** (PNNL-25791, Revision 1): The report is undergoing WRPS legal review. PNNL will address comments once received.
- ***Proposed Risk-Based Approach for Nitrosamine Chemicals of Potential Concern*** (PNNL-26787): Also in WRPS legal review is PNNL-26787.
- ***Chemical Mixtures and Modeling Recommendations*** (PNNL-27089): On March 5, 2019, the Charter 71 Lead, IH Program Management, IH Department Manager and relevant Subject Matter Experts (SMEs) met to discuss the current findings.

Memo WRPS-1805074 recommendations were accepted and will be incorporated into the IH Technical Basis; therefore, the Charter 71 process will not be needed. The Chemical Mixture Model (CMM) will be included in the Tableau/IDAV product currently under development by PNNL.

- ***Short-Duration Vapor Concentrations in Worker Breathing Zones in and near the Hanford Tank Farms: A Summary of Current Knowledge (RPP-RPT-61280):*** The project team received all comments from WRPS and determined additional funding is needed to disposition external reviewer comments.

Chemical Worker Training

2nd Quarter Summary:

The CTEH toxicologists moderated Question & Answer (Q&A) sessions at the conclusion of *Chemical Worker Training* during the 2nd Quarter, giving the course trainees an opportunity to get answers to their toxicology and health questions.

- **January 9, 2019:** Class trainees asked Dr. Pamella Tijerina about work being done to characterize "unknown" chemical vapor compounds. She spoke about the current capabilities of the analytical laboratory methods being employed and new technology being brought online to better define sampling data. Workers also mentioned concerns over potential exposures to metals, such as chromium, from dusts generated during site excavations. A question was asked about IH plans to assess hazards from exposure to vapor chemical mixtures. Dr. Tijerina noted that PNNL is still developing recommendations that will be forthcoming in their Chemical Mixture Methodology report to be released later this year.
- **January 16, 2019:** Dr. Pamella Tijerina introduced the mission of the CPPO and CTEH's related risk communication support role. Trainees asked for some explanation to differentiate the concepts of vapor COPC vs total tank wastes.
- **January 23, 2019:** Drs. Tami McMullin and Mike Lumpkin answered questions related to potential dermal exposures of chemicals in the airborne vapors and whether localized rashes underneath clothing were likely to result. Dr. Lumpkin explained that the level of airborne compounds measured during IH monitoring and sampling would not be sufficiently high to cause an adverse effect. He said that a vapor concentration high enough to

cause adverse skin reactions would result in effects observed on all exposed skin, not just a localized part of the skin under clothing.

- **January 30, 2019:** Dr. Mike Lumpkin introduced the mission of the CPPO and CTEH's related risk communication support role. The trainees asked no questions.
- **February 27, 2019:** Class trainees expressed concern about uncertainties in compound identification in tank farm air, dermal exposures to tank vapors, and the disposition of individual cases of workers believed to be permanently injured by tank farm work. One trainee expressed concern that workers would never likely leave SCBA use as long as anyone in the workforce was worried about hazardous exposures. Dr. Lumpkin discussed the technical basis by which direct-read instrumentation (DRI) technology filled the perceived "gap" in knowledge of vapor constituents in the air. He also discussed findings from earlier PNNL research how injuries from dermal absorption of tank vapors was technically implausible. He also discussed the health implications for skin contact with condensed tank vapor liquids and mentioned the upcoming CPPO notebook on that very subject.

  March 6, 2019: Dr. Mike Lumpkin attended the Chemical Worker Training.
- **March 20, 2019:** Dr. Perez attended the Chemical Worker Training on Wednesday, March 20, 2019. There were 27 participants in the course and Dr. Perez answered questions for approximately 20 minutes following the final exam. Questions included how the COPCs are developed and whether or not the action levels established for COPCs are too low. Dr. Perez was approached by two workers following the course with questions about radiation health risk and how the detection of naturally occurring radioactive material on site contributes to the risk calculation. Dr. Perez referred the worker to the radiation experts.

  March 27, 2019: Dr. Perez attended Chemical Worker Training on March 27, 2019 from 1400 to 1500 PST. There were 15 participants in this class. Dr. Perez fielded approximately 35 minutes of questions regarding how COPCs were selected, how COCs were selected, what other chemicals are analyzed for, what was the conclusion of the Industrial Hygiene Exposure Assessment reports for AP, AX, AW, and A Farms, and when will workers in the farms be able to go without masks. A few students asked about whether a concentration for chemicals had been established below which workers would be able to go without respiratory protection.

The Data Access and Visualization Tool (DAV)

2nd Quarter Summary:

In January, a demonstration of the current state of the Tableau tools used for AX and SY exposure assessments was given to ORP during the HPP meeting. The following was accomplished in the 2nd Quarter:

- Tableau:
  - The Chemical Mixture Methodology (CMM) was incorporated into Tableau, and prototype visualizations were created for the AX Farm data set developed for the exposure assessment. Initial discussions with PNNL SMEs and WRPS IH staff were held to explore potential use cases.
  - IH and PNNL began developing the design specifications for the IDAV Exposure Assessment module in January.
  - Data conditioning for the SY Farm Exposure Assessment was conducted using Tableau. The results were shared with WRPS IH for verification.
  - Data visualization tools were developed in Tableau per IH specifications for mobile laboratory data.

Figures 1 and **2** depict steady growth in the number of DAV Tool website hits since October 2018; the majority of DAV Tool users are located in Washington state.

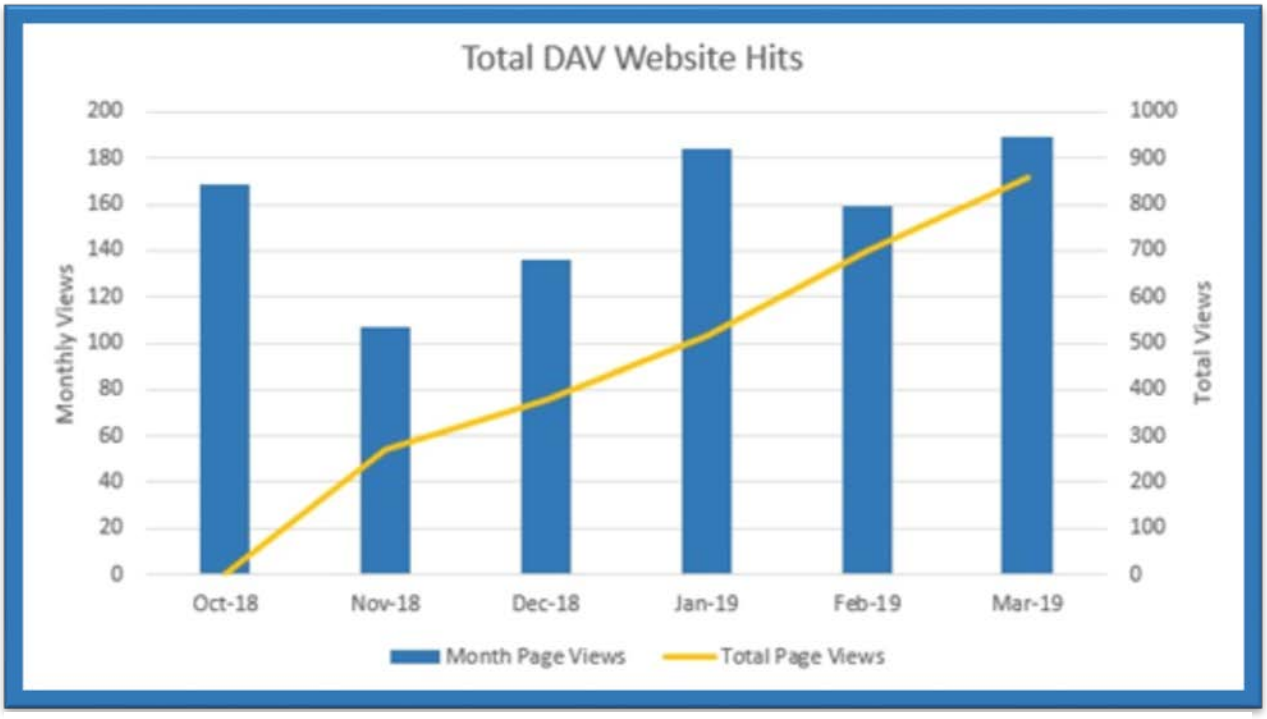


Figure 1. Total DAV Tool Website Hits during the 2nd Quarter of FY 2019

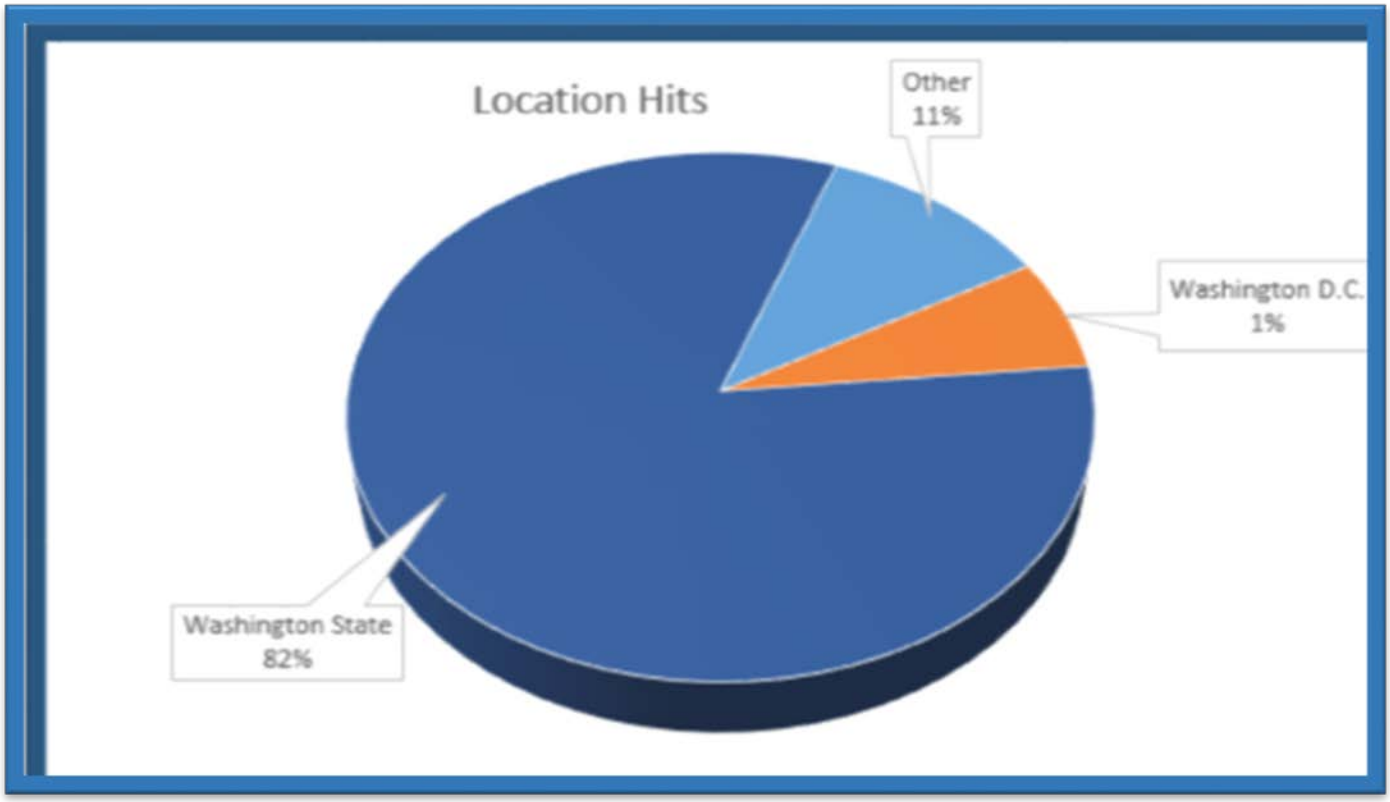


Figure 2. Total DAV Tool Location Hits during the 2nd Quarter of FY 2019

Integrated Sampling & Monitoring Strategy

2nd Quarter Summary:

IH established the scope and purpose for the *IH 200 Areas Surveillance Strategy* and briefed the ORP; additionally, IH began drafting a sampling and monitoring strategy for the IH Program. Assignments were adjusted in January, and again in March, to accommodate personnel changes. Progress continued on the draft sampling and monitoring strategy for the IH Program after meeting with IH leadership.

ToxiRAE Implementation

2nd Quarter Summary:

"Beginning February 26, 2019, the ToxiRAE Pro personal ammonia sensors [became] available for use on all shifts (days, back shift, overtime) for Risk Classification One (RC1) and RC2 work being performed in all actively ventilated farms. Industrial Hygiene technicians (IHTs) [issue] the ToxiRAE Pro monitors as a primary means of monitoring ammonia concentrations to establish any change of conditions in the farm," announced Mr. Rob Cantwell in an all-employee message.

Root Cause Analysis (RCA)

2nd Quarter Summary:

Competing priorities and the snowy February weather interfered with the RCA Team's progress. The Team's timeline has been updated. The final report is scheduled for completion in the 3rd Quarter of FY 2019.

2. Mitigating Actions/Engineered Controls

AW Stack Extension

2nd Quarter Summary:

The scope of this effort is to extend the stack's current elevation from 27 feet to 60 feet. As a result of issues identified during the permitting review, the schedule for completing the AW Stack extension was extended to FY 2019. Summarized below are the 2nd Quarter accomplishments:

- **Permitting:** The Alternative Respiratory Protection Assessment (ARPA) document was completed and is in review. WRPS is collaborating with the Department of Ecology on an approved permit.

A Farm Exhausters

2nd Quarter Summary:

Below is a summary of the 2nd Quarter accomplishments:

- **Exhausters:** The installation of the 14" pipe spools between both the Exhauster and Moisture Separators **(Figure 3)** continued in January, and is now complete. By the end of the 2nd Quarter, the effluent monitoring cabinets, seal pots, and variable frequency drive cabinets were installed, and the electrical connections were begun.

- **Exhauster Valve Manifold:** In January, the fabrication of the Exhauster Valve Manifold was completed. Preparations for the valve manifold sub-assemblies installation continued in January. In February, two of the six Exhauster Valve Manifold subassemblies were installed **(Figure 4)**. At the end of the 2nd Quarter, all six subassemblies had been installed.

***Figure* 3.**
(Left)
A Farm POR-518/POR-519 Exhauster Installation
(Photo courtesy of M. Allen.)

Figure 4. ***(Left) A Farm Exhauster Valve Sub-assemblies.*** ***(Photo courtesy of M. Allen.)***

- **Ducting Installation:** In February, ducting between the exhausters and the moisture separators was installed. Installed (51) of (56) vent ducting concrete support blocks **(Figure 5)**. Installed 14” pipe spools, valves, and expansion joints between the Exhausters and Moisture Separators.

Figure 5. Ventilation Ducting Support- Block Installation (Photo courtesy of M. Allen.)

NUCON®[1] Thermal Oxidation Vapor Abatement Unit (VAU)

2nd Quarter Summary:

The NUCON® Thermal Oxidation VAU is a collaborative effort between WRPS, PNNL, TerraGraphics, and NUCON®. Below is a summary of the 2nd Quarter accomplishments:

- **TerraGraphics:**
  - Dispositioned the WRPS comments on the *Thermal Oxidation System (TOS) Infrastructure 30% Design*.

- Finalized the design approach for eliminating condensate at the NUCON® VAU Skid.
- Continued developing the *Thermal Oxidation System (TOS) Infrastructure 60% Design* package.

NUCON®:

- Continued developing the *Preliminary System Design Description*.
- Initiated the *Preliminary Functional Specification for VAU Skid.*
- Continued developing the preliminary piping and instrumentation of the VAU skid.
- Completed the *NUCON® VAU Skid 30% Design Package* on February 19, 2019.
- Collaborated with TerraGraphics on the interface design between the TOS infrastructure and the NUCON® VAU Skid.

WRPS:

- Completed the review of the first revision of the test report and submitted comments to PNNL.
- Completed the review of NUCON® FY 2019 work plan and submitted comments to NUCON®.
- Collaborated with TerraGraphics on a path forward on two open design issues.
- Prepared a draft white paper on the rationale for sizing the TOS for the BY-108 field demonstration.
- Continued reviewing the *NUCON® VAU Skid 30% Design Package.*

PNNL:

- Received comments on the first revision of the test report from WRPS.
- The *NUCON® TOS Performance on Hanford Tank Farm Chemicals of Potential Concern*, Rev. 1, was cleared for public release.
- Continued the *Electrical Isolation Engineering Facility Modification Package*, which was modified initially for the instrumentation trailer.
- Completed installation of the 480 volt disconnect box and stand on the instrumentation trailer.
- Completed removal of various instrumentation from the instrumentation trailer.

AP Farm Ultra-Violet Fourier Transformer Infrared Spectrometer (UV-FTIR)

2nd Quarter Summary:

The goal for FY 2019 is to turn the AP Farm UV-FTIR over to Operations for ammonia. Below is a summary of the 2nd Quarter accomplishments:

- **Ammonia-Only Turn-over:** A number of parallel activities are being prepared in support of the ammonia-only turn-over and are discussed below:
  - Continued reviewing the ammonia-only results and continued interim reliability Operational Acceptance Test (OAT) testing.
  - Continued the no-gas OAT.
  - Instrumentation and Control Engineering continued developing the IDMS interface, and continued reviewing the UV-FTIR software installation plan.
  - Continued preparing the maintenance and operating procedures.
  - Continued compiling evidence to support the readiness of the UV-FTIR to Operations.
- **Multi-Gas Only Turn-over:** No update until the ammonia turn-over is complete.

Continuous Emissions Monitor Sampler

2nd Quarter Summary:

The Continuous Emissions Monitor Sampler, previously called the Autosampler, is scheduled for modification in FY 2019. In March, procurements were initiated by Avantech, and are currently being processed. The sampling-test bed fabrication is underway and activities are underway to expedite assembly of the skid when equipment being procured arrives.

Stack Monitor Turn-over/VMDS Upgrade

2nd Quarter Summary:

The goal for FY 2019 is to turn the monitors over to Operations. Summarized below are the 2nd Quarter accomplishments:

- **Set-point Calculation:** All set-point calculations have been drafted for ammonia with the exception of AW.
- **Test Requirements:** Test requirements have been drafted for ammonia and multi-gas for AX, AZ, AN, and AW Farms.
- **AX Farm Stack Monitors:** The test plan supporting the interim OAT has been approved. Initial prerequisites for AX-126 and 127 began on March 27, 2019.

In addition to the turn-over activities, the design work for the installation of the ultra violet-differential optical absorption spectrometer (UV-DOAS) stack monitor in A Farm continued.

Public Address System (PA)

2nd Quarter Summary:

The focus in FY 2019, to install all the reader boards associated with the PA system, has been realized. All 16 reader boards had been installed and functionally tested by the end of February. The newly installed equipment was integrated into the WRPS Guardian CentrAlert Speaker and Shift Office Event Notification (SOEN) system in February and March, and an *Integrated Test Plan* was submitted and approved by WRPS on January 22, 2019. The remaining scope for the PA Project as a whole is finalizing closeout deliverables and programming modifications to the CentrAlert/SOEN Systems, ensuring a smooth transition for users and administrative personnel to Operational Use/Turn-over to Operations.

SST Farm Automation

2nd Quarter Summary:

The goals for FY 2019 are to install the remote monitoring equipment at both TX and TY Farms with turn-over to Operations. In January, Mission Support Alliance finished relocating the 2220 W Building network hub. The following was accomplished during the 2nd Quarter:

- **SST Remote Monitoring Equipment:** Veolia Nuclear Solutions (VNS) was sub-contracted to perform the work early in the quarter. VNS performed design validations in TX/TY Farm on the liquid-level electrical and mechanical design modifications, which were approved in January and integrated in the T-Complex Field Construction statement of work package.
- **T-Complex Field Construction:** The construction statement of work was routed and approved in January, and responses to requests-for-proposals (RFPs) from construction subcontractors were received in February. As of the end of March, the construction contract remains in procurement for processing.

FFAPR and PAPR

2nd Quarter Summary:

As part of the overall research and implementation of the FFAPRs in Tank Farms, an IH SME attended a tour of the Mine Safety Applications (MSA) factory for respiratory cartridges in North Carolina in mid-January. Full-Face Air-Purifying Respirators (FFAPR) were rolled out in AX, AY, and AZ Farms on February 21, 2019, and in AP and AW Farms on March 19, 2019.

FFAPRs are now implemented for all RC1 and RC2 work activities in all actively ventilated tank farms (SY, AN, AX, AY, AZ, AP, and AW). Employees retain the option to voluntarily upgrade respiratory equipment to supplied air. The IH Newsletter reported that, “[i]t was a smooth transition” and “work was performed efficiently.”

3. Information Sharing/Communication

Chemical Vapors Solution Team (CVST) Meetings

2nd Quarter Summary

January 2019:

The CVST held a meeting on January 9, 2019. Sixty people attended. The ESH&Q Chemical Protection Integration Manager began the meeting by presenting the *HPMC Occupational Medical Services (HPMC OMS) CPPO Notebook*. He also gave an update on the rollout of FFAPRs in AP and AN Farms, as well as an update on the ToxiRAE personal monitor rollout.

February 2019: The February 13, 2019, CVST Meeting was cancelled due to adverse winter weather.

March 2019: The March CVST meeting took place on March 13, 2019. Jason Brustad kicked off the meeting with a presentation about an AOP-15 Event for odors outside of AW Farm. Clark Carlson presented new technology that will be utilized in the fugitive emissions campaign.

CVST Sub-team Meetings

2nd Quarter Summary:

January 2019: The CVST Communications Sub-team meeting met on January 28, 2019.

February 2019: No CVST Sub-team meetings were held in February.

March 2019: The CVST Communications Sub-team meeting was held on March 11, 2019.

HanfordVapors.com Metric

2nd Quarter Summary:

The Hanford Vapors Website logged over 5,000 views in the 2nd Quarter FY 2019, a 13% decrease from the previous quarter **(Figure 6)**. However, the volume of Settlement Agreement documents posted in Q1 make a comparison difficult. Twenty nine new items were reported as uploaded to the site during the 2nd Quarter, providing refreshed content. As fewer new vapor-related reports are developed, the number of new materials has decreased, which may explain the decrease in website hits during the 2nd Quarter. In this reporting period, the website experienced an average of 1816 hits per month, and 61 hits per day.

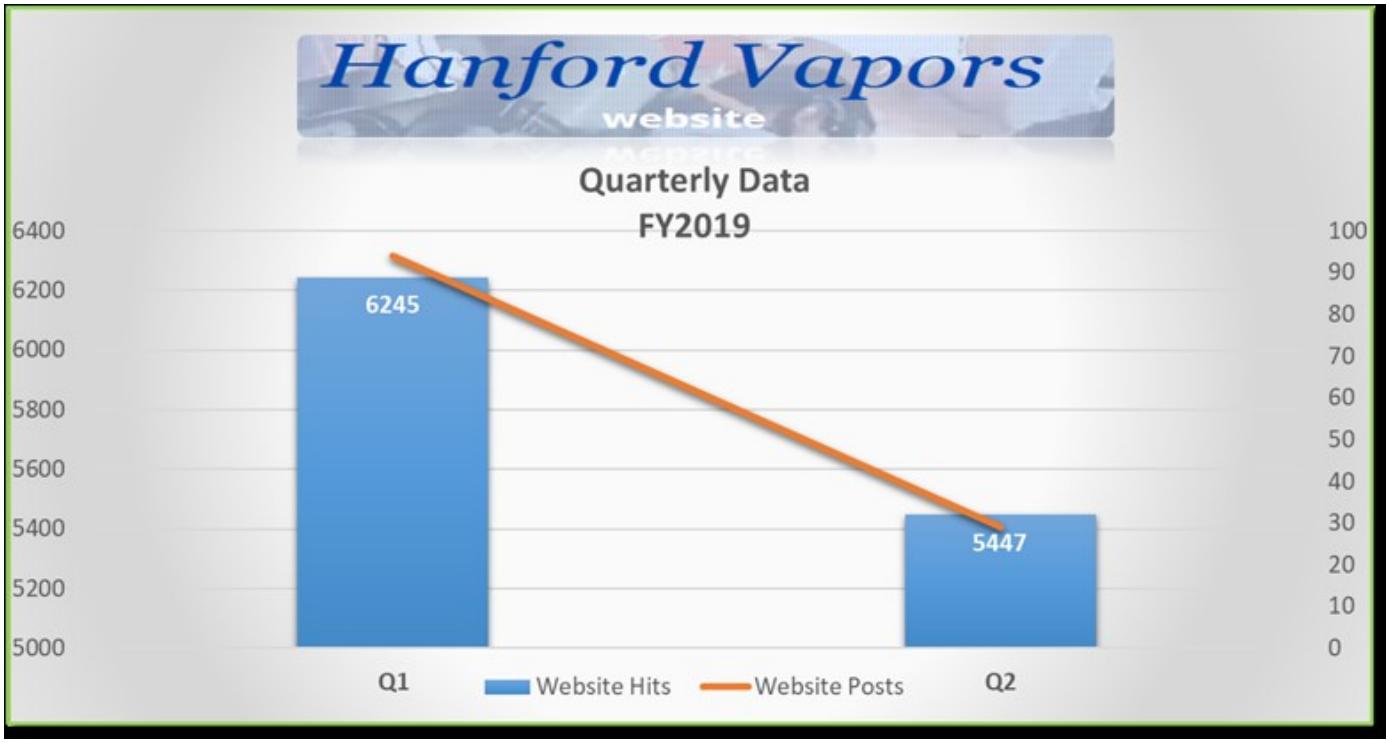


Figure 6. Hanford Vapors Website Quarterly Data

CPPO Notebook Metric

2nd Quarter Summary:

The *CPPO Notebook* was developed as an additional mechanism for managers to share vapors-related information with the workforce. It is delivered on a weekly basis in two primary formats: a PowerPoint presentation (with speaker notes), and a video narrated by a technical expert. Ten notebooks were distributed in the 2nd Quarter of FY 2019 on a range of topics including:

- HPMC Occupational Medical Services
- Health Insurance Portability and Accountability Act
- Information on the risks of dermal exposure to the chemicals in tank vapors
- Updates on the AW Farm stack extension, and the fugitive emissions work
- The results of the CTEH re-assessment
- Chemical information on ammonia, hydrocarbons, and what is a carcinogen

Management's use of the notebook is determined through self-reporting via email buttons that are provided as part of the distribution each week.

In the 2nd Quarter of FY 2019, those editions of the Notebook produced and distributed were reported to be used 93 times. **Figure 7** shows a slight decrease in the utilization of this vapors communication tool in the 2nd Quarter of FY 2019. This is likely due to the notebook's availability through the weekly Safety Startup. Use of the notebook is a lagging indicator as older editions are often randomly used throughout the year – affecting an increase in the data documenting actual use over time (this data is reflected in the WRPS vapors communications distribution table as it is obtained).

The *CPPO Notebooks* are also posted on the WRPS internal website, accessible through the main page Vapors Protection tab, and from CPPO, CVST, and IH webpages. In addition to the routine weekly distribution to WRPS managers, a link to the notebook is sent to Team Vapor Representatives (TVRs) each week. Tracking the use of the narrated notebook files, accessed from intranet traffic, reveals a significantly higher utilization rate than that provided through management self-reporting. Web data includes all editions of the notebook viewed this timeframe, regardless of when they were originally distributed. This is depicted in **Figure 7** as well.

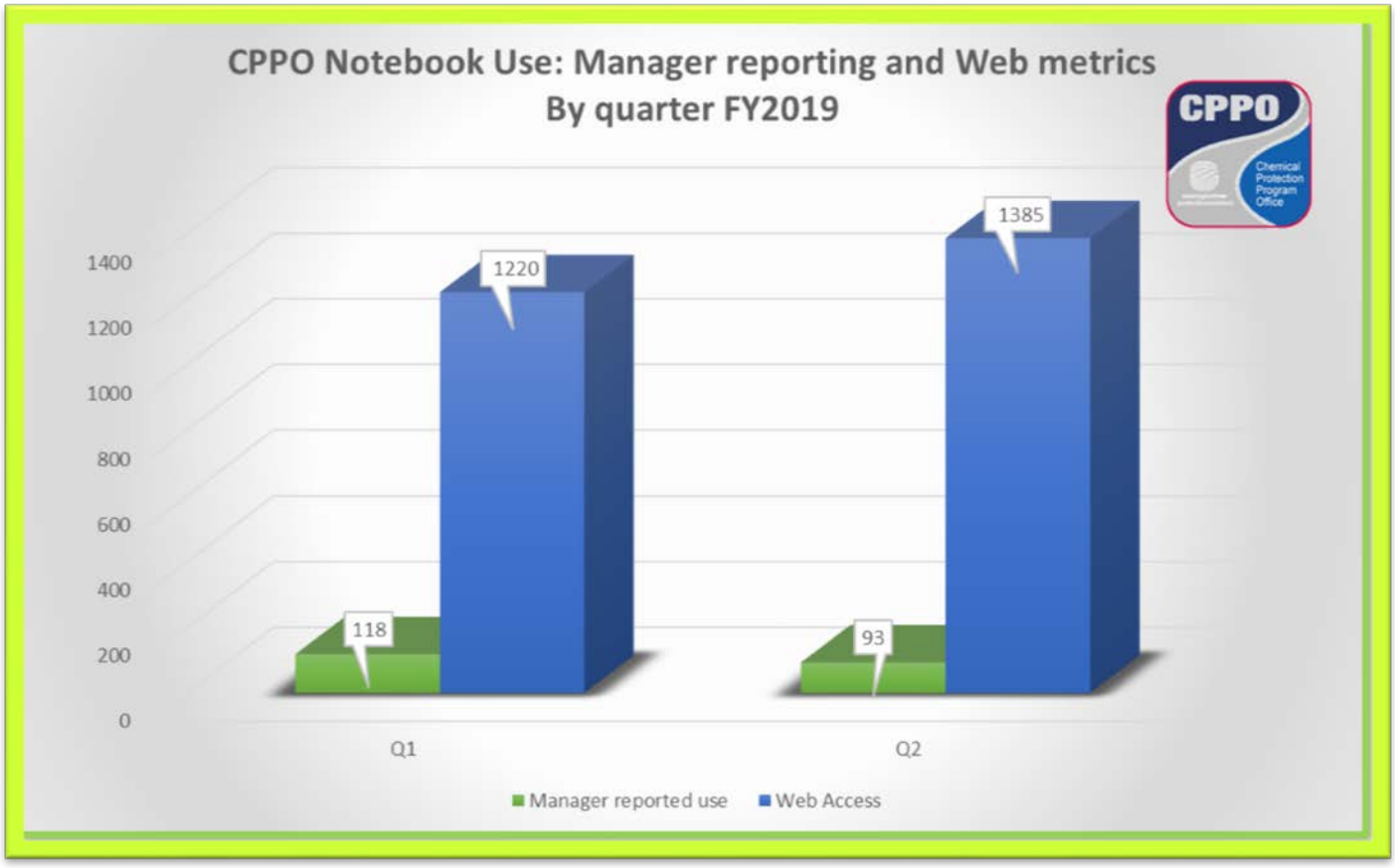


Figure 7. FY 2019 CPPO Notebook Use through the 2nd Quarter

CPPO Requests and Production Metrics

2nd Quarter Summary:

The CPPO routinely summarizes complex, technical, vapors-related information for a general audience and has provided monitoring results, report summaries, presentations, a weekly report on WRPS vapors activities, and other information for distribution through established communication mechanisms such as the *Solutions* newsletter and the HanfordVapors.com website. At the end of the 2nd Quarter FY 2019, the CPPO had completed and delivered 48 vapors-related communications to the workforce, almost the same number as this time last year. With the exception of the Settlement Agreement document releases (Website Requests/Site Updates) in the 1st Quarter, this is consistent with completed Information Products for FY 2019. **Table 2** shows that the products provided during the 2nd Quarter primarily consisted of the *CPPO Notebook*, updates to the external website, and field visits/Chemical Worker Training support provided by CPPO SMEs. The CPPO Look-Ahead continues to be an effective tool to capture strategic planning and coordination of vapors-related communications development, including timing and topics.

Table 2. CPPO Vapors Information Products FY 2019

CPPO Vapors Information Products Completed FY19	Q1	Q2	Q3	Q4	FY Total
Presentations (includes CPPO Notebook and CVST)	10	10	0	0	20
CPPO Reports and Weekly Report	3	3	0	0	6
Articles, Summaries, and Message Maps	6	1	0	0	7
Surveys, Focus Groups, and Recommended Actions	2	2	0	0	4
Website Requests/Site Updates	94	17	0	0	111
Videos	0	1	0	0	1
Field Visits	14	14	0	0	28
Chem Worker Training Support	7	6	0	0	13
Totals	**136**	**48**	**0**	**0**	**190**

The CPPO also tracks the distribution of all identified vapors-related communications throughout WRPS. The data for the 2nd Quarter is shown in **Table 3** and indicates that vapors-related information has been shared with the workforce 2590 times since the beginning of the FY in a variety of formats. This is somewhat reduced from the previous quarter – likely due to weather related closures. Vapors-related information is primarily shared with the workforce through the Morning Meeting/Pre-Shift Brief that field managers hold with the workforce, followed by *CPPO Notebooks* and ESH&Q all employee emails and web postings. *Solutions*, the WRPS newsletter, routinely includes a short synopsis of the weekly Notebook with a link so that all workers can access the information at will. Other communication events occur less frequently, such as the CVST meeting, but provide targeted vapors-related information to the workforce.

WRPS Vapors Information Distribution Avenue	Q1	Q2	Q3	Q4	FY Total
All Employee Email/Meetings & ESHQ Comm.	13	15	0	0	28
CPPO Notebook*	105	93	0	0	198
CPPO Report and Weekly Report	5	3	0	0	8
Fact Sheet & Information	0	0	0	0	0
Meeting - CVST *	2	2	0	0	4
Meeting - CVST Sub-team meeting *	3	2	0	0	5
Meeting - Hanford Advisory Board Briefing *	1	1	0	0	2
Meeting/Briefing*	11	8	0	0	19
Meeting -Morning/Pre-Shift Brief*†	1125	1031	0	0	2156
Presentation*	0	0	0	0	0
Safety Start	5	9	0	0	14
SOEN	8	18	0	0	26
Solution Article	8	8	0	0	16
Survey and Focus Group	0	1	0	0	1
Tours*	0	0	0	0	0
Vapors Weekly Update or Website Post	95	17	0	0	112
Video	0	1	0	0	1
Totals	**1381**	**1209**	**0**	**0**	**2590**

* Face-to-face communication †Data reported with all vapor questions in quarterly metric

Table 3. WRPS Vapors Information Distribution Avenue – FY 2019

Chemical Protection Engagement: Vapors-Related Questions

2nd Quarter Summary:

WRPS established several formal avenues through which workers may pose vapors-related questions; the Ask Us link on the Vapors Protection tab on the WRPS internal website (CPPO manages the resolution of these submittals); the Contact tab on HanfordVapors.com (C&PR manages the resolution of these submittals); CVST meetings (Co-chair of CVST coordinates responses to these questions); and finally, questions may be posed directly to a technical expert within the CPPO, either through email or a face-to-face exchange in the field.

A concerted effort has been made to capture each of these questions and track them through to resolution. Since the numbers are fairly small, they are aggregated and reported on a quarterly basis. In the 2nd Quarter of FY 2019, five questions were received through the above-described channels. All were answered during this same timeframe. No questions are outstanding as of the end of the 2nd Quarter.
The questions focused on the impact of radiation on tank chemicals, ammonia sampling, AP Stack monitoring, alternative respiratory protection assessments (ARPAs), and understanding the risk of skin exposure to tank chemicals.

The total number of questions, and average days to answer is shown for each channel in **Figure 8**. Questions posed through the internal web link, or to CPPO SMEs directly, were the avenues used by the workforce this quarter. The latter demonstrated the longest time to provide a response due to the complexity of the questions, and in one instance a *CPPO Notebook* was prepared to provide the information to a wider audience. The weighted average for time to answer all questions this quarter was 6 days.

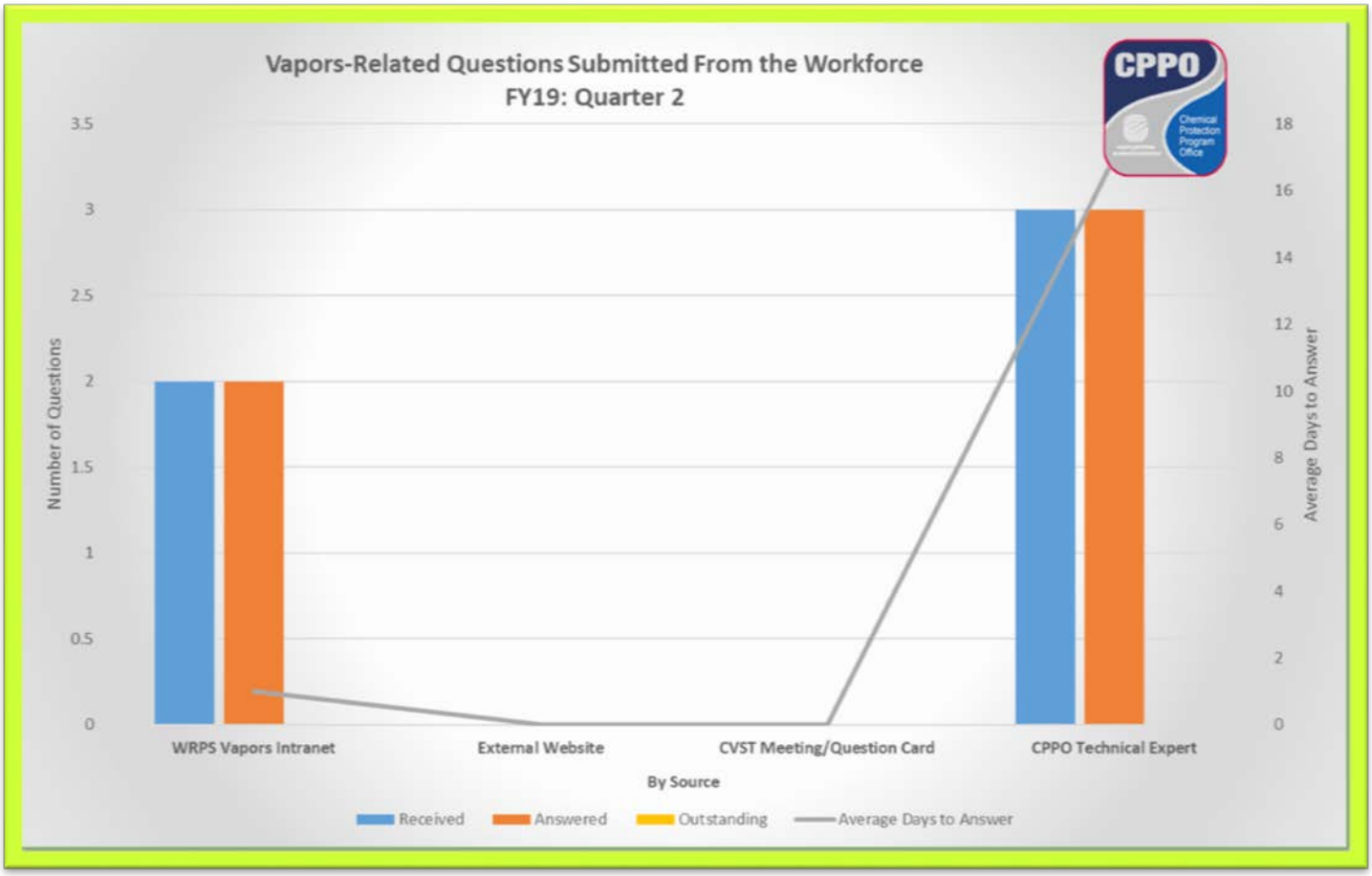


Figure 8. The 2nd Quarter Vapors-Related Questions and Days to Answer

WRPS Vapors Communications

January 2019 Update:

January 3, 2019, Industrial Hygiene Communication:
Subject: "ToxiRAE Personal Ammonia Sensor AP Farm Implementation"

January 7, 2019, Solutions, Issue 465:
Subject: "ToxiRAE Personal Ammonia Sensor AP Farm Implementation"
Subject: *CPPO Notebook* published an "Update on the A Farm Exhauster Installation Activities."

January 8, 2019, Industrial Hygiene Communication:
Subject: "Monthly Routine Testing Results – Chemical (Anions) and Bacterial Testing – Respiratory Protection Equipment and Surfaces, December 2018"

January 10, 2019, Industrial Hygiene Communication:
Subject: "ToxiRAE Personal Ammonia Sensor AW Farm Implementation"

January 14, 2019, Solutions, Issue 466:
Subject: CPPO released the *CPPO Notebooks* titled "HPMC Occupational Medical Services" and "Why Ammonia?"

January 15, 2019, Industrial Hygiene Communications:
Subject: "Wintergreen Odor in Scott Masks"

January 17, 2019, Industrial Hygiene Communications:
Subject: "ToxiRAE Personal Ammonia Sensor AX/AY/AZ Farm Implementation"

January 21, 2019, Industrial Hygiene Communication:
Subject: "Correction: ToxiRAE Personal Ammonia Sensor AN and AX/AY/AZ Farm Implementation"

January 21, 2019, Safety Flash Industrial Safety:
Subject: "Chemical Exposure Evaluation Process"

January 21, 2019, Solutions, Issue 467:
Subject: CPPO released the *CPPO Notebook* titled "AW Farm Stack Extension."

January 28, 2019, 8:23 a.m. Shift Office Event Notification:
Subject: "Entered AOP-015 for odors reported inside 271-AP. Access to 271-AP is restricted unless authorized by CSM."

January 28, 2019, 5:20 p.m. Shift Office Event Notification:
Subject: "Sample analysis for the TF-AOP-015 event has been completed and the results are at or below background levels. Exiting AOP-015."

January 28, 2019, Industrial Hygiene Communication:
Subject: "Expectation of ToxiRAE Pro Use"

January 28, 2019, Solutions, Issue 468:
Subject: CPPO released the *CPPO Notebook* titled "How the Health Insurance Portability and Accountability Act (HIPPA) Impacts Vapor Event Reporting."

January 29, 2019, WRPS Communications & Public Relations:
Subject: "Odors reported at 271AP"

January 31, 2019, Industrial Hygiene Communication:
Subject: "Monthly Routine Testing Results"

February 2019 Update:
February 4, 2019, 10:01 a.m. Shift Office Event Notification:
Subject: "Entered AOP-015 for odors between AY-2 and AY-1 change trailers exterior of AY Farm. Stay Clear of the area. CSM"

February 4, 2019, 3:09 p.m. Shift Office Event Notification:
Subject: "Initiated EIR-2019-006 [for] odors between AY-1 & AY-2 change trailers AOP-015. POC Thea Hall."

February 5, 2019, 12:41 p.m. Shift Office Event Notification:
Subject: "Sample analysis for the TF-AOP-015 event has been completed and the results are below action levels. Exiting AOP-015. CSM"

February 5, 2019, Solutions, Issue 469:
Subject: *Solutions* reported that the CPPO published a *CPPO Notebook* titled "How the Health Insurance Portability and Accountability Act (HIPPA) impacts Vapor Event Reporting."

February 6, 2019, Industrial Hygiene Communication:
Subject: "APR Restart with MSA Face Pieces and Cartridges – AN Farm."

February 7, 2019, Industrial Hygiene Communication:
Subject: "Ensuring Proper Operation of [self-contained breathing apparatus] SCBA Equipment in Lower Temperatures."

February 20, 2019, Industrial Hygiene Communication:
Subject: Rob Cantwell, Manager ESH&Q, announced, "Tomorrow, February 21, MSA FFAPRs will be implemented for RC1 and RC2 activities in AX, AY, and AZ Farms."

February 21, 2019, All-employee Email: a message from Rob Cantwell, Manager ESH&Q:
Subject: "Full implementation of ToxiRAE Pro Personal Ammonia Sensor."

February 21, 2019, 4:21 p.m. Shift Office Event Notification:
Subject: "Issued Standing Order OP-18-007 REV 3, to expand ToxiRAE pilot program to AX, AY, AZ farms on weekends and backshifts. CSM"

February 21, 2019, All-employee Email: a message from Rob Cantwell, Manager ESH&Q:
Subject: "Full-Face Air-Purifying Respirators (FFAPR) update"

February 25, 2019, Solutions, Issue 470:
Subject: *Solutions* reported that the CPPO published a *CPPO Notebook* titled "Fugitive Emissions at Hanford Tank Farm" and another titled "CTEH's 2018 Reassessment Report" in February.

February 26, 2019, 3:55 p.m. Shift Office Event Notification:
Subject: "Issued Standing Order SO-OPS-18-007, Rev.4, ToxiRAE Use and Alarm Response, to expand ToxiRAE use to all actively ventilated farms on all shifts. CSM"

March 2019 Update:

March 18, 2019, Solutions, Issue 473:
Subject: *Solutions* reported that the CPPO published a *CPPO Notebook* titled "What is a Carcinogen?"

March 18, 2019, Solutions, Issue 473:
Subject: *Solutions* reported, "Filtered respirators authorized for AP and AW Tank Farms."

March 18, 2019, Message from Rob Cantwell, Manager ESH&Q
Subject: "APR Restart with MSA Face Pieces and Cartridges in AP and AW Tank Farms."

March 19, 2019, 8:51 a.m. Shift Office Event Notification:
Subject: "Entering AOP-015 for MO2249. All personnel exit MO2249. Access is restricted to MO2249."

March 19, 2019, 10:30 a.m. Shift Office Event Notification:
Subject: "Initiated EIR-2019-012 for MO2249 AOP-015 entry. POC: Becky White. CSM."

March 19, 2019, 1:13 p.m. Shift Office Event Notification:
Subject: "AEI carpenters (AOP-015) have been released to return to work. CSM"

March 19, 2019, 1:24 p.m. Shift Office Event Notification:
Subject: "Entering AOP-015 for NE Corner of TY farm on Camden Avenue. All personnel stay clear of TY farm."

March 19, 2019, 3:01 p.m. Shift Office Event Notification:
Subject: "Initiated Event Investigation (2019-013) for TY Farm AOP-015 entry. POC: Larry Dickerson. CSM"

March 19, 2019, 5:56 p.m. Shift Office Event Notification:
Subject: "Sample analysis for the TF-AOP-015 event at MO-2249 has been completed and the results are at or below background levels. Exiting TF-AOP-015"

March 20, 2019, 4:13 p.m. Shift Office Event Notification:
Subject: "*Exiting AOP-015* for NE Corner of TY farm on Camden Avenue. Sample results are below action levels. Normal access is restored to TY Farm. CSM"

March 21, 2019, 10:17 a.m. Shift Office Event Notification:
Subject: "*Entering AOP-015* or 244A lift station. All personnel stay clear of 244A lift station. CSM"

March 21, 2019, 12:43 p.m. Shift Office Event Notification:
Subject: "Initiated Event Investigation (2019-014) for 244A AOP-015 entry. POC: Thea Hall. CSM"

March 21, 2019, 4:26 p.m. Shift Office Event Notification:
Subject: "Exiting AOP-015 for 244A DCRT. Sample results are below background levels. Normal access is restored to 244A. CSM"

March 27, 2019, Solutions, Issue 474:
Subject: *Solutions* reported that the CPPO published a *CPPO Notebook* titled "Dermal Absorption of Hanford Tank Chemical Vapors."

Engagement/Site Visits

January 2019: CPPO and CTEH have participated in over a dozen site visits with different WRPS teams since early FY 2018 with the goal of educating the workforce about CPPO. This particular workforce engagement activity is an FY 2019 CPPO priority, and is reported on in the *Monthly Report*. Furthermore, the HAMTC Safety Representatives requested that the interface meeting be held three times a month instead of four. CPPO and CTEH engaged the following groups in January:

- **Productions Operations/Central Operations: January 9, 2019**
- **SST Retrieval and Closure Radiological Controls Teams: January 16, January 23, and January 30**

February 2019 Update:
CPPO and CTEH have participated in 15 site visits with different WRPS teams since early FY 2018, educating the workforce about vapors-related communications and engagement efforts. This particular workforce engagement activity is an FY 2019 CPPO priority, and is reported on in the *Monthly Report*. CPPO and CTEH engaged the following groups in February:

- **Retrieval & Closure (R&C)/Projects Instrument Technicians & Electricians: February 6, 2019**

March 2019:
CPPO and CTEH availed themselves to 20 different WRPS teams in the 2nd Quarter. This particular workforce engagement activity is an FY 2019 CPPO priority, and is reported on in the *Monthly Report*. CPPO and CTEH engaged the following groups in March:

- **Retrieval & Closure/Pipefitters/Millwrights: March 6, 2019**
- **Vadose Sampling Pre-Job Meeting March 19, 2019**
- **POR 126/127 Exhauster Maintenance Pre-Job Meeting March 26, 2019**

Focus Groups/Surveys

2nd Quarter Summary:

The CPPO identified two efforts to assess the effectiveness of the vapors-related information provided to the workforce in FY 2019. This quarter, the CPPO conducted a FY2019 Focus Group evaluating the effectiveness of the vapors information resources provided to first line supervisors in the field. CPPO and C&PR co-led the groups. The draft report is in review and is expected to be published in the 3rd Quarter.

AOP-15 Events

January 2019:

January 28, 2019, 8:23 a.m. Shift Office Event Notification:
Subject: "*Entered AOP-015* for odors reported inside 271-AP. Access to 271-AP is restricted unless authorized by CSM."
January 28, 2019, 5:20 p.m. Shift Office Event Notification:
Subject: "Sample analysis for the TF-AOP-015 event has been completed and the results are at or below background levels. *Exiting AOP-015*."

February 2019:

February 4, 2019, 10:01 a.m. Shift Office Event Notification:
Subject: "*Entered AOP-015* for odors between AY-2 and AY-1 change trailers exterior of AY Farm. Stay Clear of the area. CSM"
February 4, 2019, 3:09 p.m. Shift Office Event Notification:
Subject: "Initiated EIR-2019-006 [for] odors between AY-1 & AY-2 change trailers AOP-015. POC Thea Hall."
February 5, 2019, 12:41 p.m. Shift Office Event Notification:
Subject: "Sample analysis for the TF-AOP-015 event has been completed and the results are below action levels. *Exiting AOP-015*. CSM"

March 2019:

March 19, 2019, 8:51 a.m. Shift Office Event Notification:
Subject: "*Entering AOP-015* for MO2249. All personnel exit MO2249. Access is restricted to MO2249."
March 19, 2019, 10:30 a.m. Shift Office Event Notification:
Subject: "Initiated EIR-2019-012 for MO2249 AOP-015 entry. POC: Becky White. CSM."
March 19, 2019, 1:13 p.m. Shift Office Event Notification:
Subject: "AEI carpenters (AOP-015) have been released to return to work. CSM"

March 19, 2019, 5:56 p.m. Shift Office Event Notification:
Subject: "Sample analysis for the TF-AOP-015 event at MO-2249 has been completed and the results are at or below background levels. *Exiting TF-AOP-015"*
March 19, 2019, 1:24 p.m. Shift Office Event Notification:
Subject: "*Entering AOP-015* for NE Corner of TY farm on Camden Avenue. All personnel stay clear of TY farm."
March 19, 2019, 3:01 p.m. Shift Office Event Notification:
Subject: "Initiated Event Investigation (2019-013) for TY Farm AOP-015 entry. POC: Larry Dickerson. CSM"
March 20, 2019, 4:13 p.m. Shift Office Event Notification:
Subject: "*Exiting AOP-015* for NE Corner of TY farm on Camden Avenue. Sample results are below action levels. Normal access is restored to TY Farm. CSM"
March 21, 2019, 10:17 a.m. Shift Office Event Notification:
Subject: "*Entering AOP-015* for 244A lift station. All personnel stay clear of 244A lift station. CSM"
March 21, 2019, 12:43 p.m. Shift Office Event Notification:
Subject: "Initiated Event Investigation (2019-014) for 244A AOP-015 entry. POC: Thea Hall. CSM"
March 21, 2019, 4:26 p.m. Shift Office Event Notification:
Subject: "Exiting AOP-015 for 244A DCRT. Sample results are below background levels. Normal access is restored to 244A. CSM"

External Assessments Recommendation Status

2nd Quarter Update:

The recommendations status columns in **Table 4** below are defined as follows:

- **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.

CPPO validated that ninety-seven (97) percent of the recommendations have been addressed by actions and/or deliverables that are either **Complete** or **Field Work Complete**. Of the 371 total recommendations:

- **Eighty-eight (88) percent** have been verified Complete and are considered closed.
- **Nine (9) percent** are verified as Field Work Complete and are awaiting final deliverables (i.e. documentation) to close.
- **Three (3) percent** have ongoing actions and are In Progress.

The majority of the remaining recommendations that are **In Progress** are scheduled to be completed in FY 2019.

Table 4. External Assessments Recommendations Status Table

Report	As of March 28, 2019				
	Total	Validated Complete	Field Work Complete	In Progress	Pending
TVAT	117	100	11	6	0
OIG	3	3	0	0	0
NIOSH	54	44	9	1	0
EA-32	31	26	4	1	0
CTEH	24	23	1	0	0
VMEP I, II	67	62	4	1	0
Other	75	69	5	1	0
Total	371	327	34	10	0

External Assessments Recommendations Status

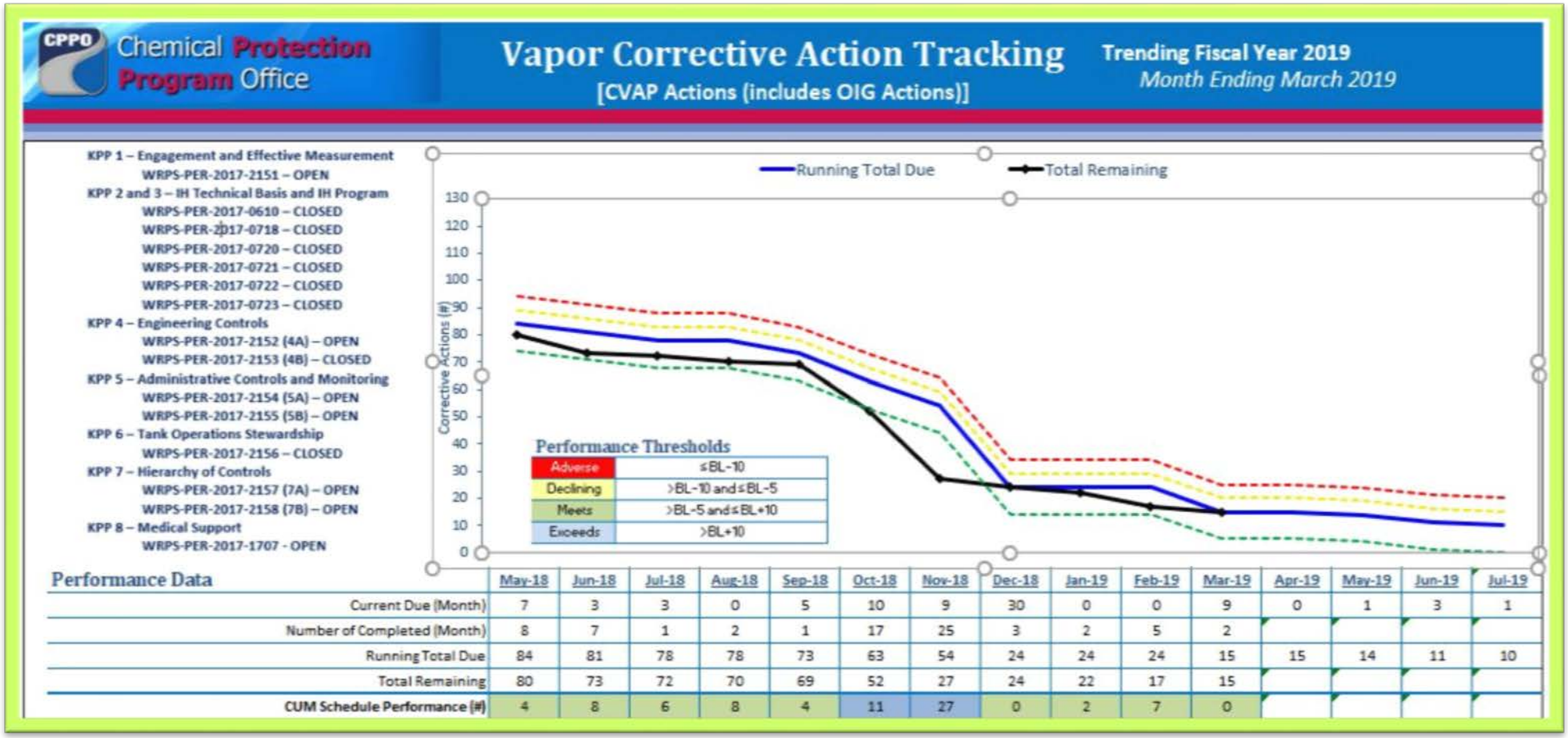
CVAP Corrective Actions Tracking Metric

February 2019 Update:

The CPPO tracks vapor-related Problem Evaluation Requests (PER), with the goal of communicating PER resolution status. The performance data in **Figure 9** 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 CVAP actions are captured in the PERs listed in **Figure 9** below, including the 3 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 FY 2017; 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 9,** following five corrective action due date extensions, depicts the status of the CVAP total corrective actions and shows that 2 actions were completed in March, but overall action closures are right on schedule. In addition, out of the original 128 E-Stars actions, which were identified at the beginning of FY 2016, there are 15 open actions remaining.



Performance Data

	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19
Current Due (Month)	7	3	3	0	5	10	9	30	0	0	9	0	1	3	1
Number of Completed (Month)	8	7	1	2	1	17	25	3	2	5	2				
Running Total Due	84	81	78	78	73	63	54	24	24	24	15	15	14	11	10
Total Remaining	80	73	72	70	69	52	27	24	22	17	15				
CUM Schedule Performance (#)	4	8	6	8	4	11	27	0	2	7	0				

Figure 9. Vapor Corrective Action Tracking

4. Sampling and Monitoring

Mobile Lab

2nd Quarter Summary:

During the 2nd Quarter, the mobile lab completed the Winter background study during January and February. This completes the background studies for each of the four seasons. In addition to the Winter background study, the lab performed area monitoring in support of the AP-102 Pump Removal in January, and also participated in fugitive emissions sampling in February at a large, on-site sewer system near 244-AR. In March, the Proton Transfer Reaction-Mass Spectrometer (PTR-MS) underwent alternative Selective Reagent Ion (SRI) testing, and performed area sampling in the 200 E A Corridor.

Cartridge Test Reports

2nd Quarter Summary, No Update:

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, STC, for review and comment. The review allowed the implementation of FFAPR in the double shell farms with the tested cartridges. The cartridge testing effort in the 1st Quarter of FY 2019 focused on issuing the AX Exhauster report, titled, *Analysis of Air-Purifying Respirator (APR) and Powered Air-Purifying Respirator (PAPR) Cartridge Performance Testing on a Hanford AX Tank Farm Exhauster*, and were numbered PNNL-27860 Vol. 1 and Vol. 2. Following the issue of the AX Exhauster report, efforts focused on processing the data from BY-108 (PAPR) and BY-110 (APR) field testing. The results were included in a draft report that is in the 30 day review process. The AP Exhauster data is still being processed.

Respiratory Protection Equipment and Surfaces: Monthly Routine Testing

2nd Quarter Summary:

WRPS has a routine monthly testing program to evaluate randomly-selected Respiratory Protective Equipment (RPE) and surfaces for chemicals and bacteria. This program involves IH wipe sampling on 60 randomly-selected RPE (face pieces and regulators) for chemical and bacterial presence from the three main Mask Issue and Sanitizing Stations (2704 HV, 278 AW, and MO 2256). Samples for chemical content are

analyzed at ALS Labs in Salt Lake City Utah. Samples for bacterial content are analyzed at TriCities Labs, Kennewick, WA.
Analytical results from January, February, and March 2019's testing indicated that there were no instances of chemical disinfectant contamination on any of the RPE tested. Likewise, the results of bacterial testing on RPE and Mask Issue Station surfaces continue to indicate that they are considered exceptionally well-sanitized. Please note that there are no known federal standards or guidelines for "clearance" levels of either chemical (anions) or bacteria on RPE and related surfaces. Results are available on the WRPS Respiratory Protection Intranet.

[1]NUCON is a registered trademark of Nucon International, Inc., Columbus, Ohio.
[2]RAE Systems by Honeywell, San Jose, California.