The July 19, 2018, 3rd Quarter Summary was CPPO's 75th Weekly Report. Depicted is the 3rd Quarter Cover.

Below: Ninety-five percent of the IH 10-Wide Trailer site has been cleared and grubbed. See KPP 3. (Photo courtesy of Darren Merrill.)

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

The draft *Chemical Vapors Action Plan* (CVAP) includes Key Performance Parameters (KPPs) to monitor and measure progress and success against the plan. The CPPO is tasked with delivering on KPP 1: establishing a comprehensive vapor management communication plan, engagement processes, and effectiveness measurements. In January 2018, the CPPO conducted the first of the two required assessments with a survey of 714 members of the WRPS workforce. The results of the survey were published in May 2018 in the 2018 Workforce Vapors Information Survey. The second assessment, a focus group, is planned to take place July 30-August 2, 2018 with approximately 10 people in each of four sessions over the course of the four days. The discussions will be led by CPPO, and will last approximately one hour each. In order to minimize the impact on field work, this activity is planned to work around high-heat days and occurs at times that workers are scheduled to be out of the field. The CPPO worked with Production Control to identify groups of workers and their availability to participate in the Focus Groups.

Focusing on continuing improvement, CPPO interns are performing a review of the Hanfordvapors.com website. Their lines of inquiry focus on the website's ease of navigation, search functions, understandability, age of the information, and the usefulness of the information.

CPPO Oversight and Tracking

CPPO Notebook

The CPPO Notebook is distributed on a weekly basis to aid managers in providing vapor-related information to staff on current topics of interest. In June, the CPPO released four Notebooks:

- The last of a two-part series on nitrous oxide, a chemical of potential concern (COPC)
- Information on the results of the 2018 Vapors Information Effectiveness survey
- An update on the Fugitive Emissions Investigation Team activities
- Part one of a four-part series describing the fundamentals of toxicology and industrial hygiene

Managers are asked to reply **Yes** to their email when they intend to use the Notebook with their staff. Since the Notebook may be used weeks after distribution, the utilization data frequently changes over time, and is reflected in updates to monthly reporting. The data through June showed that an average of 20 managers each week reported using the Notebook.

WRPS Manager utilization of the CPPO Notebooks by subject and transmission date is shown in **Figure 1**. Since the beginning of FY2018, the data shows WRPS managers reported utilizing the Notebooks 715 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 2** 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 June, Narrated Notebook files were accessed 932 times. The increase, which appears to have begun in May, is coincidental with *Solutions* articles highlighting current Notebooks.

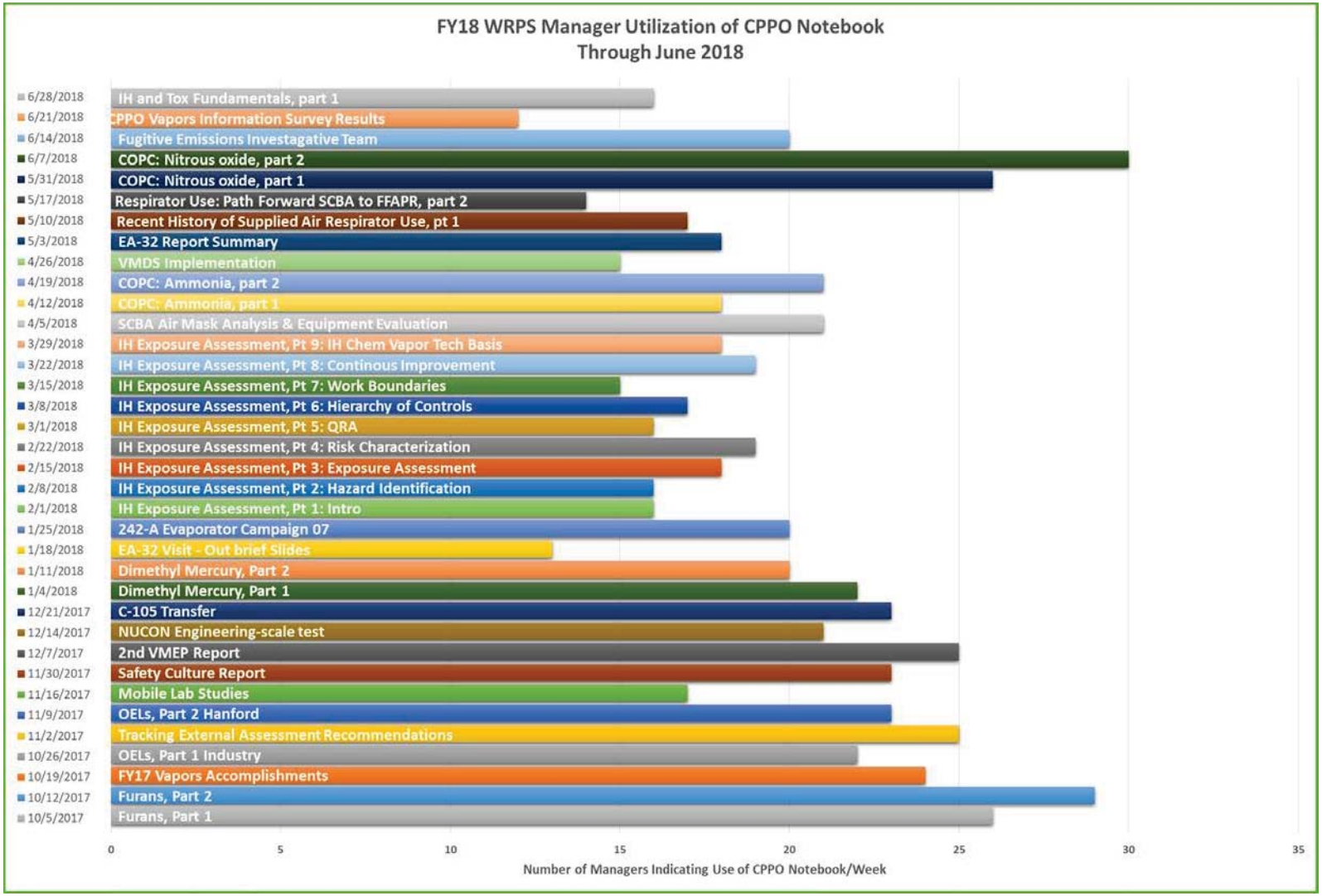


Figure 1. FY2018 Manager Utilization of the CPPO Notebook through June 2018

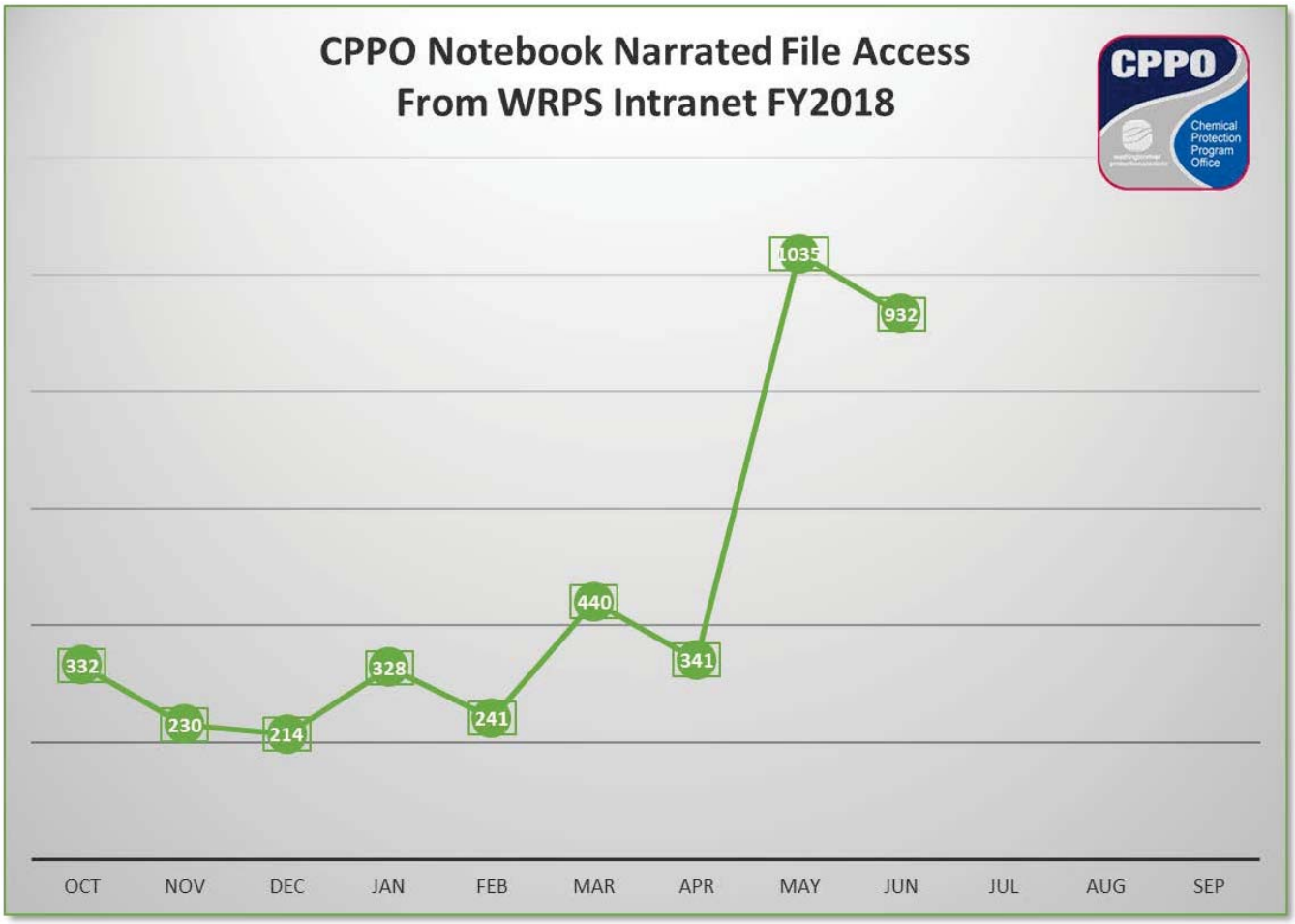


Figure 2. Narrated File Access of CPPO Notebooks from WRPS Intranet FY2018

CPPO Production Metrics

The CPPO summarizes complex, technical vapors-related information and provides monitoring results, report summaries, presentations, a weekly report on WRPS vapors activities, and other information for distribution to the workforce through established mechanisms such as the Solutions newsletter and the HanfordVapors.com website.

The vapor-related materials produced by the CPPO in June, and the three month trend, is shown in **Table 1**. Data reports are no longer summarized for the website as VMDS reporting has transitioned to supporting turnover for full-time operations. In June, the CPPO produced and provided four Weekly Reports. In addition, four CPPO Notebooks were delivered. These materials provide vapors-related information to a variety of audiences and are distributed via email, and internal and external websites.

Table 1. CPPO Vapors Information Products Completed FY2018

CPPO Vapors Information Products Completed FY18	April	May	June	FY-to-Date Total
Data Report (Monitoring Data)	1	0	0	**21**
Presentations (includes CPPO Notebook and CVST)	5	4	4	**37**
CPPO Reports and Weekly Report	3	4	4	**33**
Information Requests†	0	0	0	**1**
Articles, Summaries, and Message Maps	0	0	1	**12**
Surveys, Focus Groups, and Recommended Actions	0	0	0	**5**
Website Requests/Site Updates	2	0	0	**3**
Videos	0	0	0	**0**
Monthly Totals	**11**	**8**	**9**	**112**

Table 2. WRPS Vapors Information Distribution Avenue

WRPS Vapors Information Distribution Avenue	April	May	June	FY-to-Date Total
All Employee Email/Meetings & ESHQ Comm.	2	3	6	**33**
CPPO Notebook*	87	75	78	**764**
CPPO Report and Weekly Report	3	4	4	**33**
Fact Sheet & Information	0	0	0	**0**
Meeting - CVST *	1	1	1	**10**
Meeting - CVST Sub-team meeting *	2	2	2	**28**
Meeting - Hanford Advisory Board Briefing *	0	0	1	**2**
Meeting/Briefing*	3	5	5	**31**
Meeting -Morning/Pre-Shift Brief*	408	430	384	**3453**
Presentation*	0	0	0	**0**
Safety Start	0	0	3	**4**
SOEN	0	2	9	**21**
Solution Article	2	2	3	**19**
Survey and Focus Group	0	0	0	**2**
Tours*	0	0	0	**0**
Website/Individual Inquiry †	0	0	0	**0**
Vapors Weekly Update or Website Post	16	9	15	**128**
Video	0	0	0	**0**
Monthly Totals	**524**	**533**	**511**	**4528**

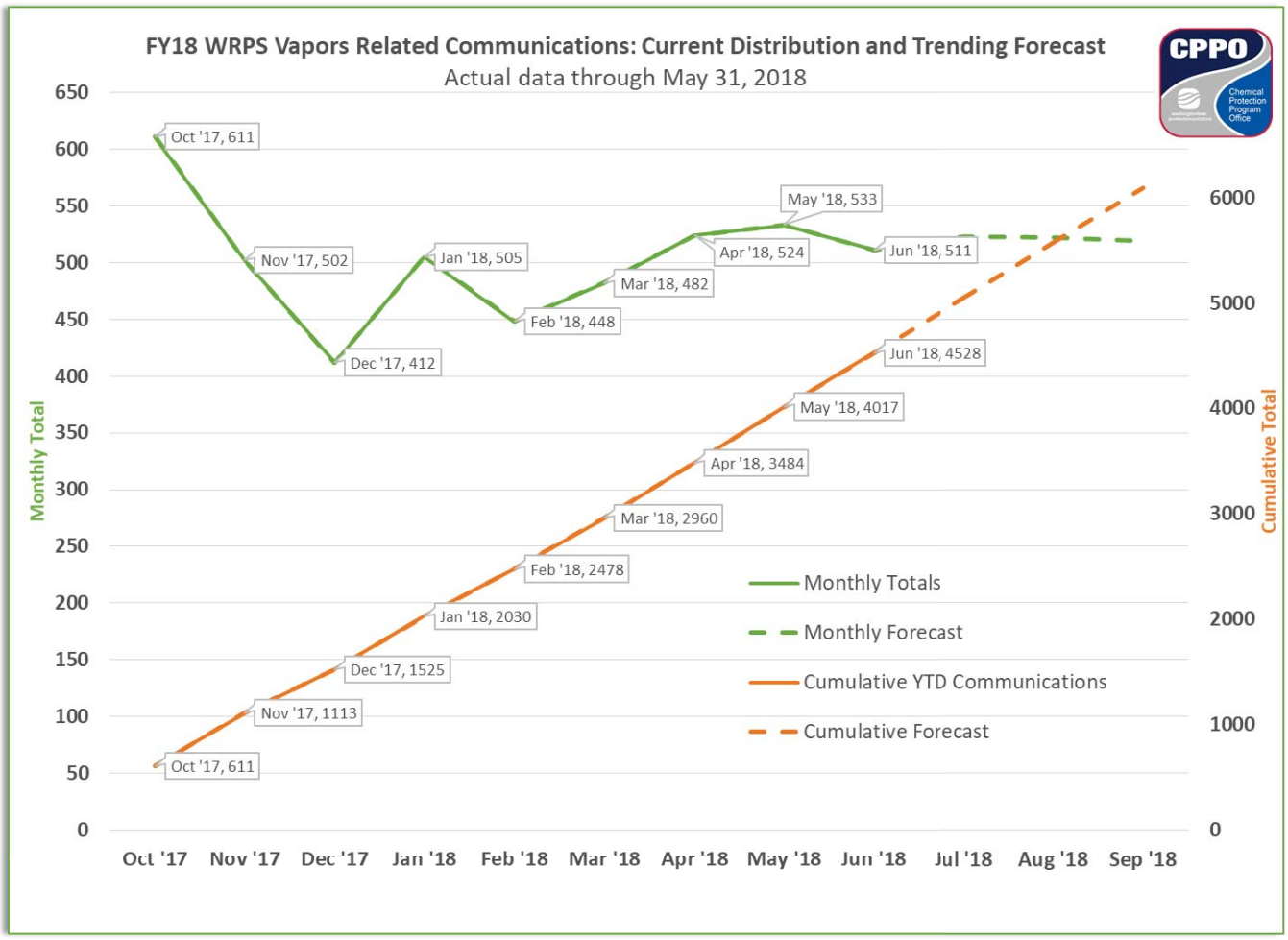


Figure 3. FY2018 WRPS Vapors-Related Communications: Current Distribution and Trending Forecast

WRPS Vapors Related Communications Distribution

The total number of documented WRPS vapors-related communications provided to the workforce in FY2018 to date is shown in **Table 2**. The data for June shows a continued steady rate of over 500 vapors-related communications per month. POD meetings remain the primary source of vapors-related information provided to the workforce, followed by utilization of the CPPO Notebook.

The forecast delivery for WRPS vapors-related communications to the workforce in FY2018, including monthly and cumulative estimates, is shown in **Figure 3**. The data trend indicates that, at this rate, WRPS remains on track to deliver over 6,000 vapors-related communications to the workforce in FY2018 - largely through briefings and face-to-face interactions with the workforce.

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Engagement and Effective Measurement

- CTEH

Update:

Toxicologist Chris Kuhlman was the CTEH representative on site for the second and third weeks in July. Dr. Kuhlman and the CPPO SME team attended a plan-of-the-day (POD) meeting with Waste Operations workers to introduce CPPO and available information resources. CTEH continued developing CPPO Notebooks on work boundaries at Hanford and industrial hygiene principles. Dr. Kuhlman also supported the Chemical Worker III training sessions, answering toxicology- and vapors-related questions from workers.

Key Performance Parameter 1

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

- Chemical Protection Engagement: Communications

Update:

Beginning June 28, CPPO offered a four-part CPPO Notebook titled *Toxicology and Industrial Hygiene Fundamentals: Parts 1-4,* developed by CTEH.

- Chemical Protection Engagement: Data Access and Visualization Tool

Update:

The newest iteration of the DAV tool, VMDS Explorer, was begun in the 1st Quarter and debuted in the 3rd Quarter. CPPO began demonstrating the draft tool in July. HAMTC Safety Representatives, members of the workforce, senior management, and last week, the AN Team previewed the VMDS Explorer/DAV Tool. The demonstration introduced the many new functions that show VMDS technology results.

- Chemical Protection Engagement: Chemical Vapors Solutions Team (CVST)

The CVST held its monthly meeting on July 11, 2018. The meeting focused on the status of the settlement agreement and the ongoing litigation activities. Mr. Rob Cantwell, ESH&Q Manager, discussed the approval processes for use of the full face air purifying respirators (FFAPR) in a corridor between A Farm change trailers and AX Farm, and the associated monitoring and IHT rounds/routines. He announced the arrival of the StoneTurn Consultants, the third party reviewers, to assess the implementation of FFAPR in SY and AP Tank Farms the week of July 23, 2018. Mr. Keith Kline, Vapor Management Expert Team (VMET) member, discussed the oversight of the Tank Vapor Assessment Team recommendations and implementation actions, and Mr. George Weeks, Vapor Technology Project

Manager, discussed the Air Pollutant Graphical Environmental Monitoring System (APGEMS) modeling software and accompanying report that were released in May 2018. The final presenter was Mr. Chaz McGlothlin, Retrieval & Closure Safety and Health Manager, who provided an update to work later this summer to install an interim barrier in SX Farm. The interim barrier is a paving product which is applied at very high temperatures (~300 °F). The project is pursuing approval of an Alternative Respiratory Protection Assessment to allow a downgrade from supplied air to FFAPR and/or powered air purifying respirators to support personnel during application.

The CVST Communications Sub-team held a meeting on July 16, 2018. Communications, Management, Operations, HAMTC Safety Representatives, Nuclear Chemical Operators, Radiological Control Technicians, and CPPO were in attendance. The Communications lead provided status on litigation and settlement discussions, AP Farm FFAPR rollout, evaporator campaigns, and the progress of issues brought up by the workforce in previous Communications Sub-team meetings (i.e., sunshield and golf cart status). The 222-S Lab Manager and members of his management team attended the meeting and provided a status on alpha contamination recently discovered on pre-filters at 222-S. Sample results showed that the filters contained minimal contamination (1 mrem) and that all lab workers had been briefed on the findings. A question was asked about the sampling techniques performed on the 222-S samples to ensure representative samples were collected. The lab team provided a response which was understood and accepted by the individual. The Chemical Protection Integration Manager provided status on both [1]C_2Sense® testing and WRPS's purchase of [2]ToxiRae personal monitors which will be used by the workforce to monitor ammonia.

Chemical Protection Engagement: Hanford Vapors Website Updates

- CVST Agenda - June 13, 2018
- CPPO Weekly Report - June 14, 2018
- CPPO Weekly Report - June 21, 2018
- CPPO Weekly Report - June 28, 2018
- HPP new page
- PNNL-26777 – *Proposed $_{HTF}$OELs for Chronic Exposures – COPCs with Regulatory Guidelines,* Rev. 0
- PNNL-26819 – *Proposed $_{HTF}$OELs for Chronic Exposures – Nitrile-Class COPCs and 2,4-Dimethylpyridine,* Rev.0.
- PNNL-26820 – *Hanford Tank Vapor Chemicals of Potential Concern Update for Fiscal Year 2017,* Rev. 0.
- SST Stewardship Project Execution Strategy (RPP-RPT-60443; Rev. 0)
- PNNL-27530, Rev. 0, The APGEMS-TF Atmospheric Dispersion Model for Tank Farms Applications

- Chemical Protection Engagement: Workforce Engagement

  Update:

  The CPPO attended the Waste Operations POD meeting (where approximately 15-20 members were in attendance) and provided a briefing on the CPPO group, what vapors information products are available, and where to find them. The briefing was followed by a Q&A session, where the workforce had questions about the CPPO Notebooks and what information they provided. After our discussion, the manager said moving forward a more concerted effort would be made to review the notebooks with his team.

- Chemical Protection Engagement: Worker Feedback

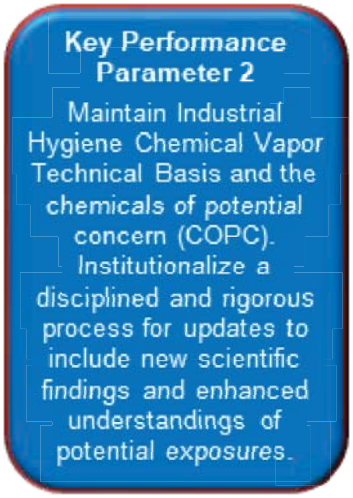
  For a comprehensive compilation of recent examples of Worker Feedback, see the CPPO 3rd Quarter Summary here.

KPPs 2 and 3. IH Technical Basis and IH Program

- IH Manual and Technical Basis

  Last update 7/19/2018:

  In the 3rd Quarter, the TOC-IH-58435, *Industrial Hygiene Manual*'s updated Section 1, *Introduction;* Section 2, *Practices of the Industrial Hygiene Program;* Section 3, *Reporting Occupational Exposure and Medical Monitoring*; and Section 4, *Tank Waste Chemical Vapors,* were published on the Industrial Hygiene website. Section 5, *Reporting Occupational Exposure and Medical Monitoring*, is in final review. Section 6, *Emergency Response*, was removed from the IH Manual, as the emergency response procedures are governed by Emergency Preparedness Department. On June 11, 2018, TFC-PLN-173, Rev. A-3, *Use of FFAPR in Actively Ventilated Tank Farms*, was released. TFC-IH-EA-50032, *AP Farm Exposure Assessment Procedure* is complete and in the final stage of Workflow Review and Approval Process (WRAP).

  The *Risk Communication Techniques* and *Crucial Conversations* training courses are well underway at the end of the 3rd Quarter, with ~73% of the Industrial Hygiene workforce trained in *Risk Communication Techniques* and ~100% trained in *Crucial Conversations*.

Health Process Plan (HPP)

Last update 7/19/2018:

The HPP process has transitioned into the TFC-Charter-71 process, which provides assessments for both the technical and the economic feasibility of implementing study findings and recommendations. The following HPP studies conducted by PNNL are released as final versions under the TFC-Charter-71 process at the end of the 3rd Quarter: *Proposed OELs for Chronic Exposures – COPCs with Regulatory Guidelines*, *Hanford Tank Vapors FY 2017 Chemicals of Potential Concern Update,* and P*roposed OELs for Chronic Exposures – Nitrile Class COPCs and 2,4-Dimethylpyridine*.

At the end of the 3rd quarter, two studies were in internal review by PNNL prior to release as final versions: *Proposed Acute Exposure Limits for COPCs with Regulatory Guidelines* and *Recommendations for Sampling and Analysis of Hanford Waste Tank Vapors.* Two studies are currently being reviewed by IH for technical and economic impact per the Chart 71 process. They are *Proposed Risk-Based Approach for Nitrosamine Chemical of Potential Concern* and *Proposed Occupational Exposure Limits for Furans.* The PNNL report, *Assessing the Potential for Chronic or Acute Health Effects from Exposure to COPC Mixtures,* has been developed to draft status, and is being held for further development in FY2019.

Leading Indicators

FINAL UPDATE****

Amendment: Over **1,200** different chemicals have been identified in tank farm headspace vapors. Some of the chemicals have Occupational Exposure Limit (OEL) levels that are lower than the ability to detect and measure them with real-time instruments. Ideally, the measurements of one chemical will tell us something about the levels of the more difficult-to-measure Chemicals of Potential Concern (COPCs). When such relationships exist, the measureable chemicals are called **leading indicators (LIs)**. The final version of *FY18 Leading Indicator Phase 2 Report*, PNNL – 27449, released in April, describes a process for identifying LIs for use across the tank farms. While the 2016 Phase 1 report relied on pairs of analytical sampling data from the Tank Waste Information Network System (TWINS) and Site Wide Industrial Hygiene Database (SWIHD), the Phase 2 report took advantage of data not previously available, including data from the respirator cartridge filter testing program, and the RJ Lee Mobile Laboratory. The Phase 2 report adopted a different statistical process for determining the confidence level for an LI to predict whether one or more COPCs are present above or below their OEL levels. The

Key Performance Parameter 3

Maintain Industrial Hygiene Program and institutionalize vapor program requirements, best practices and program parity, and complete necessary training to support full implementation at the beginning of FY2018.

PNNL researchers reported that the trio of ammonia, nitrous oxide, and mercury may together serve as LIs for up to 45 of the 61 total COPCs, and 21 of 24 COPCs found on Tank Vapor Information Sheets (TVIS) for individual tank farms. The three candidate compounds are routinely monitored in real-time using direct reading instruments in the tank farms.

KPP 3 – Leading Indicators is complete with the publication of PNNL-27449 and will no longer be reported on in the CPPO Weekly Report. PNNL-27449 will be posted to the external website once it has gone through clearance.

Air Dispersion Modeling

Last update 7/19/2018:

The Air Pollutant Graphical Environmental Monitoring System (APGEMS) modeling software (version 1.0) and accompanying report were released in May. The report describes the APGEMS-TF software and presented three tests cases illustrating model performance for simulations involving the AP, AW, and AN Stacks, as wells as the 242-A Evaporator. The test cases were selected to provide model predictions of ammonia and mercury air emissions during low, medium, or high wind conditions. The APGEMS-TF software was refined and version 1.1 was delivered to WRPS for acceptance testing.

Central Residence for Industrial Hygiene Technicians (IHT)

Update:

The 10-Wide trailer has been constructed and is currently stored at the Pac Mobile yard in Pasco, Washington. The installation site is in the 200 East area on 4th Street near 218A across from PUREX. The subcontractor cleared and grubbed 95% of the site and completed the excavation for the large tie down slabs used to anchor the 10 wide. The formwork and rebar for the trailer tie down slabs is being installed in preparation for concrete placement. The existing parking lot is acceptable for reuse, and the area has been cleared. The lot will be crack sealed, striped and bumpers placed for parking.

Figure 4. The existing parking lot near new IH Trailer location has been cleared. *(Photo courtesy of L. Parks-Beyer)*

Figure 5. Left. IH Trailer Construction Site, July 2018. (Photo courtesy of C. Holst.)

Figure 6. The IH Trailer Construction Site, July 2018. (Photo courtesy of D. Merrill.)

KPP 4. Engineering Controls

- A Farm Exhausters

Update:

Exhausters: Over the last two weeks, crews assembled and completed the exhauster slab concrete forms in the A Farm **(Figure 7)**. Additionally, the team began setting rebar for the foundation.

A/AX Farm Road Expansion: The team continued establishing crossing plates so that support cranes can access the area.

Procurement/Fabrication: A material request was completed for the POR518/POR519 exhauster valve manifold, the manifold support, the access

platform, ventilation ducting, riser assemblies, duct stand assemblies, and concrete blocks.

Figure 7. Exhauster Slab Concrete Forms for A Farm Exhauster (Photo courtesy M. ALLen.)

AW Stack Extension

Update:

Over the last two weeks, the preparation for the installation of the AW Farm Stack extension continued. The following was accomplished during the reporting period:

- The non-radiological and radiological permit application continues. The radiological permit is with ORP for review, and the non-radiological permit is with Washington State Department of Ecology for review.
- The stack foundation fabrication, and preparation for installation activities continued. The site foundation has been completed.

Key Performance Parameter 4

Complete engineering control concept demonstrations for Strobic Air Tri-Stack® and NUCON® International, Inc. thermal combustion in support of unrestricted work boundaries.

AN Stack Extension

Update:

During the reporting period, Design Engineering activities focused on evaluating the proposed foundation for the stack extension.

[1]Strobic® Air Dilution Fan

Update:

Efforts focused on the Strobic® Air Dilution Fan off-site testing. The following was accomplished over the last two weeks:

- Testing, initiated in the 3rd Quarter, was completed during in this quarter. The unit in testing configuration is shown in **Figure 8**.
- Efforts started on evaluating the test results and data.

Figure 8. The Strobic Unit in Testing Configuration, July 2018. ***(Photo courtesy of T.Stoner.)***

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

Update:

Since the beginning of July, the following was accomplished:

TerraGraphics:

- Work continued on the *Technical Demonstration Conceptual Design* for BY-108, including providing a briefing on the 90% conceptual design to the NUCON Integrated Project Team. The design package was submitted or review.

NUCON®:

Provided phone consultations to WRPS and PNNL.

WRPS:

- WRPS worked with the 222-S Lab and third party analytical labs to determine a path forward for solving analytical challenges with N-Nitrosodimethylamine (NDMA) encountered during the engineering-scale test.
- Provided final comments on the draft *Quick Look Report*.
- Prepared documentation to procure the PNNL portion of the FY2019 NUCON® scope.

PNNL:

PNNL is evaluating test results and preparing the draft test report, as well as incorporated WRPS's comments into the draft test report.

KPP 5. Administrative Controls and Monitoring

Permanent Installation of VMDS Equipment in AP Farm

Last update 7/19/2018:

Key Performance Parameter 5

Define unrestricted work boundaries and implement monitoring on active stack ventilation and unrestricted work boundaries in the A farms to provide defense-in-depth.

In FY2017, WRPS identified viable VMDS components for use in the Tank Farms, and the turnover of AP Farm ultra-violet Fourier transform infra-red (UV-FTIR) to Operations was initiated. Turnover activities continued into FY2018 and the main 3rd Quarter activities included the following:

- Approval of the Functions & Requirements Document (RPP-RPT-60580).
- Approval of the calibration gas calculation (RPP-CALC-62150).
- Continuing to prepare the test plan for startup activities. The draft plan was completed and is awaiting review by the Joint Test Working Group.
- Continuing efforts on upgrading and replacing the flowmeter, modifying the Human Machine Interface for readout location,

preparing the operations, maintenance, and calibration procedures, and procuring a vendor for calibration support.
- Continuing to obtain approvals for the uncertainty evaluation (RPP-RPT-60669).
- Releasing Material Requisitions for procurement of the test gases.
- Obtaining calibration support for the UV-FTIR.
- Completing the Operational Acceptance Tests (OAT) needed to support turnover. The OAT was split into three separate OATs to optimize 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:** The draft OAT was prepared, reviewed and comments resolved. The OAT is awaiting a Joint Test Working Group review.
  - **No-Gas Testing OAT**: The draft OAT test procedure was prepared and is currently being reviewed by a cross-discipline team.
  - **Gas Testing OAT**: The draft OAT is currently being prepared.

Stack and Boundary Monitors

Last update 7/19/2018:

In addition to the turnover of the AP Farm UV-FTIR stack monitor to Operations discussed above, other stack and boundary monitoring activities are planned. The work scope includes installing stack monitors on the AW, AX (two), AN, and 702-AZ Exhausters. 3rd Quarter activities included the following:

- Performing fabrication and factory acceptance testing of the Ultra Violet Differential Optic Absorption Spectrometry (UV-DOAS) units.
- Approving the 702-AZ and AN Farm Stack Monitor design revisions.
- Preparing the AW Farm Stack Monitor design package, which is being reviewed for final approval.
- Continuing to review and incorporate comments on the 90% design package for the AX Farm Stack Monitor.
- Completing fabrication plans for all stack extensions and submitting the plans for internal engineering reviews.
- Completing work package for installation of the 702-AZ stack monitor and starting the site preparation work.
- Continuing to prepare work package for installation of the AN Farm Stack Monitor.
- Starting to prepare work package for installation of the AW Farm Stack Monitor.

- Starting efforts to obtain the excavation permit for AX Farm Stack Monitor installation.
- Procuring and receiving bundles and probes needed to support the stack monitors.

Establishing Safe Unrestricted Boundaries

Last update 7/19/2018:

Work boundaries, an administrative control, are used to help manage occupational risks. Established in the 2nd Quarter were facility boundaries as described:

- **Exclusion Zone** – the area where workers are most likely to encounter the hazard at its highest concentrations (previously Vapor Control Zone (VCZ))
- **Contamination Reduction Zone** – The transition area between the exclusion zone and the clean area or support zone (previously Vapor Reduction Zone (VRZ))
- **Support/Administrative Zone** – the location where the "co-located worker" is allowed to perform their work unmonitored
- **Industrial Zone** – This is the fence line of the 200E and 200W areas where workers are made aware of the presence of increasing industrial hazards
- **Site Boundary** – This is the edge of the Hanford site property where public access is restricted.

During the 3rd Quarter, TOC-IH-58451, *Industrial Hygiene Basis for Defining the Unrestricted Work Boundary*, was issued. IH completed a gap analysis to determine what information needed to be included in which documents, and the appropriate ESH&Q procedures were revised. The majority of controls and communications were rolled up into TFC-ESHQ-S_IH-C-48, Managing Tank Chemical Vapors.

Public Address (PA) System

Last update 7/19/2018

Activities performed in the 3rd Quarter include the following:

- Continued the many activities required to support the turnover of the second set of public address (PA) systems (AW, AN, AP and C Farms). Early in the quarter, the speaker and clarity adjustments were finalized; now efforts are focused on resolving switch and filter issues.
- Excavation, trenching, wiring, and conduit installations were completed at S, SX, and SY Farms, with the exception of resolving the switch and filter issues that are impacting the east area PA systems.

Figure 9. AP Farm Crash Gate (Photo courtesy of Gregory N. Hanson.)

- Continued the many activities required for the PA system installations at B, S, T, and U Farms, including excavating trenches, installing conduit, and starting wiring activities at T Farms. U Farm excavation and conduit installation was started at the end of the quarter.
- Installed crash gates at AP Farm and AW Farm.

KPP 6. Tank Operations Stewardship

Key Performance Parameter 6

Institutionalize a tank operations stewardship program that minimizes required Tank Farm personnel entries; and establishes parameters for locating ancillary personnel and offices.

Pilot SST Stewardship Program

Last update 7/19/2018:

During the 3rd Quarter, the SST Stewardship Program's scope and schedule were reviewed. It was determined that the TY Farm installation activities would be deferred until FY2019, while the TX Farm and TY Farm designs, along with the *SST Stewardship Execution Strategy Document (FY 2015 LEAN Report),* would still be completed in FY2018. Activities in the 3rd Quarter of FY2018 included the following:

SST Remote Monitoring Equipment:

The TY Farm temperature and surface level design packages were completed and the contract for the TX Farm design package was awarded. The draft 60% TX Farm package has been completed and reviewed, and the comments are being incorporated. In addition to the design packages, Mission Support Alliance (MSA) started working with their construction subcontractor to support network and installation activities.

FY2015 LEAN Report:

RPP-RPT-60443, the *SST Stewardship Execution Strategy Document,* was approved in the 3rd Quarter.

KPP 7. Hierarchy of Controls

Key Performance Parameter 7

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

Cartridge Testing and SCBA Alternatives

Last update 7/19/2018:

The many 3rd Quarter SCBA Alternative and Cartridge Testing efforts include the following:

- On May 3, 2018, a briefing titled *AP Farm: Use of Full Face Air Purifying Respirators (FFAPR), Briefing Package was* delivered to managers which read, "SY Farm transitioned from supplied air (SA) to full-face air purifying respirators (FFAPR) in December 2017. AP Farm scheduled to transition on May 15, 2018. Implementation at other actively ventilated tank farms will follow assessment of AP Farm

implementation: AY/AZ, AX, AW, AN (*Briefing Package*, pg. 2)." The transition is consistent with the Memorandum of Agreement between WRPS and HAMTC. Workers retain the right to voluntarily upgrade to supplied air, and all entries in AP Farm require IHT coverage even when using supplied air.

- On May 17, 2018, an all-employee email stated, "Beginning as early as Tuesday, May 22, workers in AP Farm will have 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 SEG 1 & 2 work in the ventilated farms.
- In the 3rd Quarter, PNNL began circulating the draft report of its APR test findings from the SX Farm conducted in June 2017. Recent cartridge testing data collected from the AX Exhauster has been analyzed and the report is in draft. It is numbered PNNL-27558 and consists of 2 volumes. The report is in review before general distribution.
- During the quarter, a few respirator cartridges were found with carbon dusting after use. APR cartridge testing for excess charcoal dust was completed. The inventory of concern was returned to the manufacturer and replaced with fresher/newer cartridges. Cartridge lots from May 18 forward were approved for use. The dusting was determined to be a quality issue, and the manufacturer put in additional steps to prevent a recurrence.
- WRPS began the work package to support PAPR testing in BY-108. All six cartridge tests were completed; the last 2 tests on the AW Stack were completed on 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).
- 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 FY2018, was completed at the AW Farm primary exhaust stack during the transfer of AW-106 to AW-102. Samples were to PNNL laboratories for analysis

Mobile Laboratory

Update:

TerraGraphics is designing and building a new mobile laboratory for lease by WRPS. The new mobile laboratory features enhanced capabilities, including a more sensitive proton transfer reaction-mass spectrometry (PTR-MS), UV-DOAS, FTIR, Flame Ionizing Detector, Photo Ionizing Detector and a Picarro ammonia analyzer.

Since the beginning of July, TerraGraphics has focused on resolving FTIR procurement issues and confirming procedures for equipment testing and validation. The first two activities to be conducted by the new mobile laboratory are monitoring to support AP Stack ammonia spike testing, and sampling and dilution of AP Stack gas to support personal ammonia detector testing.

***Figure 10. PTR-MS Unit for the New Mobile Laboratory** (Photo courtesy of G.Weeks.)*

***Figure 11. Picarro Ammonia Analyzer for the New Mobile Laboratory** (Photo courtesy of G. Weeks.)*

Personal Vapor Monitor

Last update 7/19/2018:

The 3rd Quarter activities centered on the C_2Sense® field demonstration. The ToxiRAE Pro, [6]Ventis™Pro V, and the [7]GfG Micro IV detectors, along with the [8]ChromAir® Badges were received and included in the field demonstration. The GfG Micro IV ammonia detectors were removed because the alarms had not been disabled; the detectors will be put back into service after the alarms have been disabled. C_2Sense® completed the first version of algorithms for their ammonia detectors that allows conversion of a raw conductance signal to ammonia concentration. C_2Sense® also completed a blind comparison of the C_2Sense® ammonia detector results to the AreaRAE results. A substantial amount of the data compared very well, but there were many false positive responses on the C_2Sense® detector too. This has been a collaborative effort between the WRPS workforce, who helped develop the concept for the new testing configuration, and MSA, who assisted in providing data communication support.

KPP 8. Medical Support

The scope of KPP-8 is to support RL medical program enhancements in conjunction with other Hanford Site organizations.

Key Performance Parameter 8

Support medical program enhancements in conjunction with responsible Hanford Site organizations and establish update to WRPS process/procedures.

[1]C_2Sense is a registered trademark by C2Sense, Inc., Cambridge, Massachusetts.
[2]RAE Systems by Honeywell, San Jose, California.
[3]Strobic Air is a registered trademark of MPC Inc., Wilmington, Delaware.
[4]NUCON is a registered trademark of Nucon International, Inc., Columbus, Ohio.
[5]CEREX® Stack Monitor CEREX trademark by TECAN SP, INC. Baldwin Park, California.
[6]Ventis™ Pro5 Multi-Gas Monitor is a registered trademark by Industrial Scientific in Pittsburgh, Pennsylvania.
[7]GfG Micro IV Single Gas Detector from GfG Instrumentation, Inc.
[8]ChromAir is registered to Morphix Technologies, Virginia Beach, Virginia.