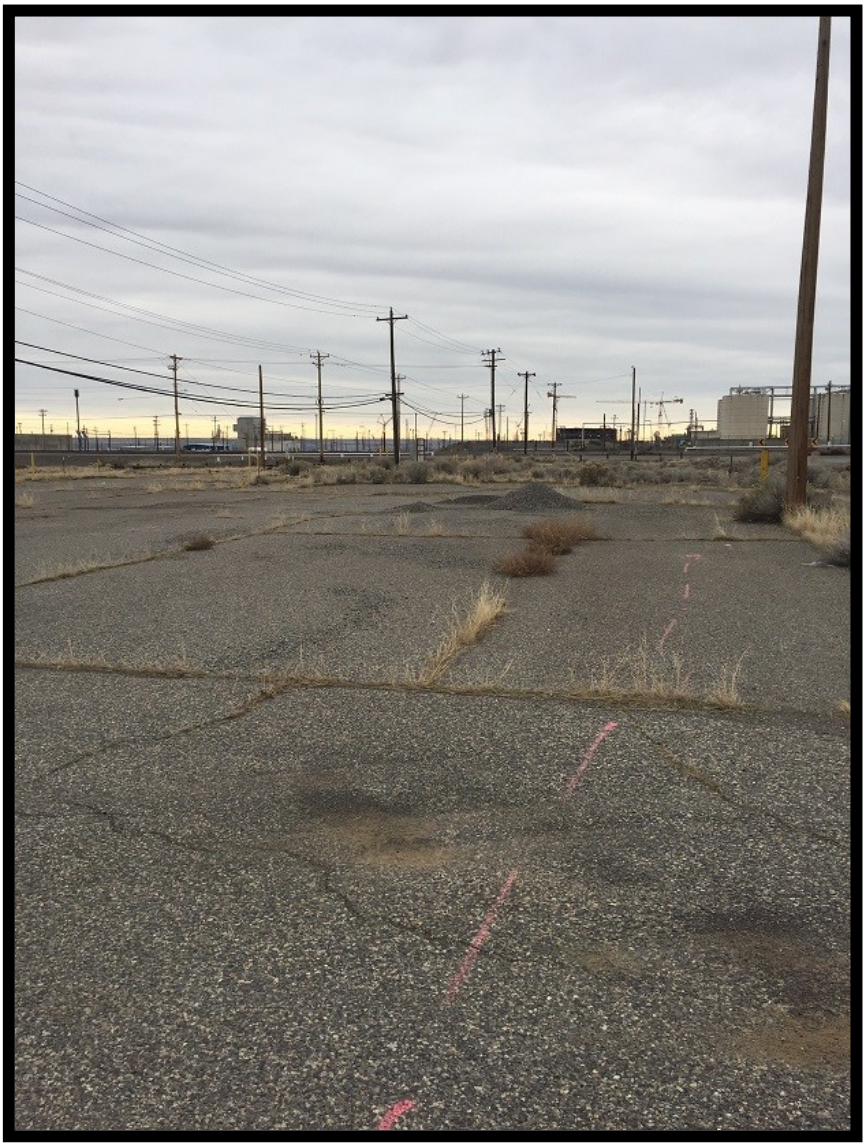
washington river protection solutions

CPPO Chemical Protection Program Office



Pictured is the future centralized mobile office building location for Retrieval Industrial Hygiene Technicians and Supervisors (in 200 East Area, near 218A across from PUREX, looking east). Note: 242-A Evaporator in the background.
Photo courtesy of Gregory N. Hanson

Tank Operations Contract
Chemical Protection Program Office
Weekly Report
March 8, 2018

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

In coordination with Industrial Hygiene and the Environmental, Safety, Health and Quality (ESH&Q) Chemical Protection Integration Manager, the first six (6) of the nine-part presentation providing an overview of the Industrial Hygiene exposure assessment process and activities specifically related to addressing chemical vapors at the tank farms were finalized. The remaining three (3) presentations are in various stages of draft.

Joining CPPO as a Communications Specialist is Ms. Hope Matthews. She has over 25 years of experience at the Hanford Site as an editor, writer, and communications professional. Her work scope includes the CPPO Notebook and other communications functions in the CPPO.

CPPO Oversight and Tracking

Hanford Vapors Website

The Hanford Vapors website logged over 3,300 views in February 2018; an increase of 7% from the previous month. As shown in **Figure 1**, the website experienced an average of 120 hits per day in February, in spite of being off-line for two days. The February average hits per day, 120, is slightly above the average FY2018 to-date hits per day, 105. However, 120 hits per day is below last year's average hits per day of 172. Eleven new items were posted to the site in February. Hanford Vapors Weekly Update, of which only two were published last month, continue to drive traffic to the site. A significant increase in traffic was noted on February 6 after odors were reported outside SY Tank Farm.

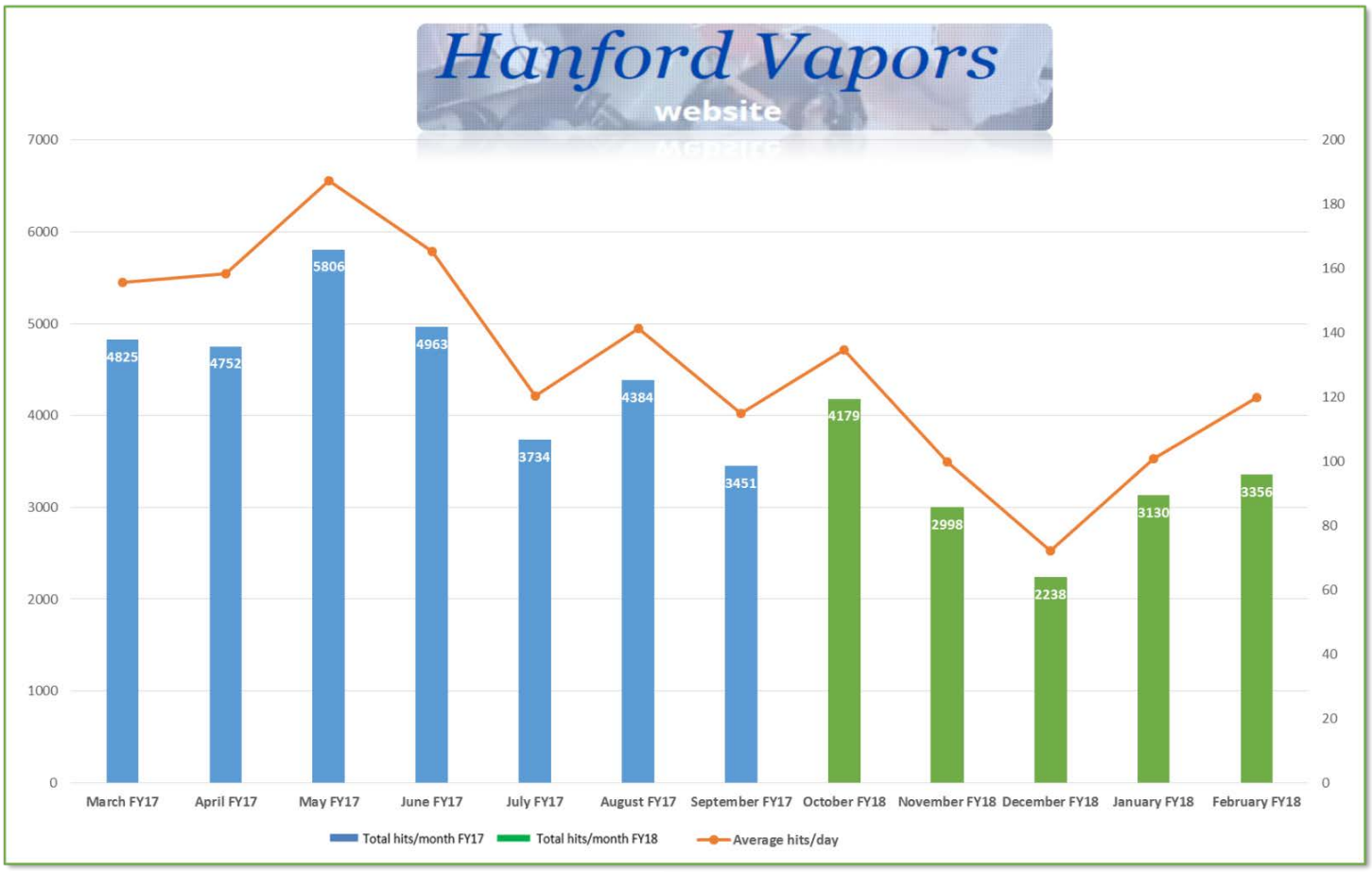


Figure 1. Hanford Vapors Website Statistics

Table 1. DAV Tool Use Statistics for January 2018: www.TankVaporsExplorer.com

2018	Total Hits	Most Popular Feature	Second Most Popular Feature	Most Popular Region	Other Popular Regions	New Users	Returning Users
February	257	Chemical Selection: Chart Type: **Single Chemical - Area** specifically **Ammonia** (7664-41-7)	Explorer-Set-Filter Explorer-Set-Filter is where the user is actively filtering on COPC Chemicals or All Chemicals.	*Washington State	District of Columbia Kentucky Maryland	36%	64%
February	***Washington State Breakdown:** 1. Total Page Views: 201 78% of page views are from Washington State Average Session Duration: ~2 min		2. Total Unique Users: 50 Region/Marketing: Yakima-Pasco-Richland-Kennewick: 49 Seattle: 1				
	3. Page views by Region: Yakima-Pasco-Richland-Kennewick: 199 Seattle-Tacoma: 2		4. New vs Returning Users				
			Yakima-Pasco-Richland-Kennewick	Seattle-Tacoma			
			New Users: 31	New Users: 1			
			Returning Users: 0	Returning Users: 0			

Data Access Visualization (DAV) Tool

Sub-contracted by the CPPO, Pacific Northwest National Laboratory (PNNL) built and successfully launched the DAV Tool early in FY2018. Engaging the user by interactive access to historical and current tank vapor samples, monitoring results, and visual representations of relevant data and contextual information, the DAV Tool promotes transparency. This sophisticated tool avails the data to the user with little technical background, and allows the more technically sophisticated user to drill down to detailed content. The DAV Tool is on the HanfordVapors.com website. February 2018 DAV Tool statistics, as provided by Google Analytics, are depicted in **Table 1**. A comparative analysis of the DAV Tool statistics will be part of CPPO's 2nd Quarter Summary.

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Engagement and Effective Measurement

- Chemical Protection Engagement: Center for Toxicology and Environmental Health (CTEH)

Key Performance Parameter 1
Establish a comprehensive vapor management communication plan, engagement processes, and effectiveness measurements.

In support of their ongoing assessment, the CTEH team continued to interview workers last week, focusing on the ways in which progress has been made in the vapors program.

Working closely with Industrial Hygiene, the CTEH team continued to develop the nine-part CPPO Notebook presentation series introducing the workforce to the process used by Industrial Hygiene to assess and control hazards.

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

The purpose and scope of the CVST as defined in the CVST Charter is, "… a joint management/employee initiative to review processes and solutions to improve Washington River Protection Solutions LLC's (WRPS's) hazard identification, controls, training, and communication for tank farm chemical odors and vapors" (TFC-CHARTER-21, Rev E-2, pg. 1). The CVST Charter also states that, "[t]he CVST shall regularly conduct meetings that are open to the general workforce" (pg.1). In FY2017, CVST meetings were generally held bi-weekly for a total of 18 meetings.

Led by the CVST Co-chairs Joel Hebdon and Don King, the CVST has recently been moving toward a once-a-month general workforce meeting for both CVST members and non-members, and a separate monthly meeting for just CVST members, intended in part to determine the agenda for the general workforce CVST meeting. So far in FY2018, the CVST has convened a total of 6 monthly meetings for the general workforce. Two general workforce CVST meetings were held in October 2017; one general workforce CVST meeting was held in November, December, January, and February. One CVST meeting for the general workforce is scheduled for March.

No CVST Sub-committee meetings were held last week.

Chemical Protection Engagement: Communications

Last week's CPPO Notebook is titled *Industrial hygiene exposure assessment: Quantitative Risk Assessment (QRA), part 5 of 9, KPP 3.* This week's CPPO Notebook is titled *Industrial hygiene exposure assessment: Risk management, part 1 Hierarchy of controls, Part 6 of 9, KPP 3.*

An all-employee email, published March 1, 2018, reported, "The Department of Energy's Office of Enterprise Assessments (EA) conducted an independent oversight assessment of progress on actions taken to address tank vapor concerns at the Hanford Tank Farm Site. This follow-up assessment focused on actions taken to address recommendations from a previous EA Assessment, Office of Enterprise Assessments Follow-up Assessment of Progress on Actions Taken to Address Tank Vapor Concerns at the Hanford Site – January 2017." WRPS received the follow-up report and it is available here.

Vapors Weekly Update, published March 1, 2018, reported that The Department of Energy's Office of Enterprise Assessments (EA) conducted an independent oversight assessment of progress on actions taken to address tank vapor concerns at the Hanford Tank Farm Site. This follow-up assessment focused on actions taken to address recommendations from a previous EA Assessment, Office of Enterprise Assessments Follow-up Assessment of Progress on Actions Taken to Address Tank Vapor Concerns at the Hanford Site – January 2017." WRPS received the follow-up report and it is available here.

Chemical Protection Engagement: Hanford Vapors Website Updates

- Vapors Weekly Update – March 1, 2018

Chemical Protection Engagement: Effectiveness Measures

The CPPO *FY2018 Vapors Information Effectiveness Survey* results are being tabulated, reviewed, and examined, in addition to being evaluated against the 2017 survey.

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

IH Manual and Technical Basis

Update:

There are eight sections in the Industrial Hygiene Manual, of which Sections 1 and 4, *Introduction* and *Tank Waste Chemical Vapors,* are published on the Industrial Hygiene website. Additionally, the following procedures have been issued:

- TFC-ESHQ-S_IH-C-66, *Identifying Chemicals of Concern in Hanford Tank Farms*

- TFC-ESHQ-S_IH-C-67, *Maintenance of the Industrial Hygiene Chemical Vapor Technical Basis*
- TFC-ESHQ-S_IH-C-48, *Managing Tank Chemical Vapors*
- TFC-PLN-34, *Industrial Hygiene Exposure Assessment Strategy*
- TFC-PLN-174, *Industrial Hygiene Chemical Vapor Technical Basis Program Plan*

IH is continuing to develop IH Manual sections.

Key Performance Parameter 2

Maintain Industrial Hygiene Chemical Vapor Technical Basis and the chemicals of potential concern (COPC). Institutionalize a disciplined and rigorous process for updates to include new scientific findings and enhanced understandings of potential exposures.

Health Process Plan (HPP)

Last update 2/15/2018:

The HPP process has transitioned into the TFC-Charter-71 process implementation. The process evaluates the studies conducted in the HPP process. The TFC-Charter 71 process conducts both technical and economic feasibility assessments for the studies with the *Proposed TFOELs for Chronic Exposures – COPCs with Regulatory Guidelines* (PNNL-26777) and *Proposed Acute Exposure Concentration Limits for COPCs with Regulatory Guidelines* (PNNL-26850) studies scheduled for review this year.

Leading Indicators

Last update 2/15/2018:

The Leading Indicators study now focuses its evaluation on three primary leading indicator compounds. These are ammonia, mercury, and nitrous oxide. The study has developed evaluation methods that compare paired data, data in which two or more samples were taken simultaneously, to various concentrations. Specifically, the project is using the reference concentrations of ½ of the occupational exposure limit (OEL), the OEL, and the excursion limit (3 times the OEL).

Maintain Industrial Hygiene Program and Institutionalize Vapor Program Requirements

Update:

Tiers 1, 2, and 3 of WRPS's three tiers of vapors training, are launched. Training bulletin TB-18-01, *The New Chemical Worker Training Program,* was issued to WRPS as required reading on January 15, 2018.

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.

- Central Residence for Industrial Hygiene Technicians (IHT)

Update:

The project to complete the centralized mobile office (MO) building for IHTs continues. The MO is slated to house approximately 100 workers. Plans are to install the MO in 200 East area on 4th Street near 218A across from PUREX. Once installed and occupied, the MO will satisfy KPP 3 goals. The trailer site design is at 90% completion and is in review. The trailer design was approved by Washington State Labor and Industries.

- Air Dispersion Modeling

Update:

The Dispersion Modeling project team has revised the Air Pollutant Graphical Environmental Monitoring System (APGEMS). The new modeling system is called APGEMS-TF. APGEMS-TF is an atmospheric dispersion model that has been optimized for modeling chemical vapor source emissions from the Hanford Tank Farms. The user interface has been simplified by making known source emission rates from known Tank Farm sources available from a simple pick list. APGEMS-TF produces atmospheric simulations utilizing actual meteorological data from the Hanford Met Stations. Simulations can be run using historical or current meteorological conditions. Post modification regression tests and test cases are complete and the model is being made available to a limited distribution for acceptance testing. The draft report summarizing the model, capabilities, limitations, and quick user's guide has been delivered and is in review.

KPP 4. Engineering Controls

Key Performance Parameter 4

Complete engineering control concept demonstrations for [1]Strobic Air Tri-Stack® and [2]NUCON® International, Inc. thermal combustion in support of unrestricted work boundaries

- A Farm Exhausters

Last update 2/15/2018

For the A Farm concrete pad, the vendor began providing submittals and initiated mobilization activities. Walk downs continued in an effort to confirm the ducting isolation activities.

- AW Stack Extension

Last update 3/1/2018:

Efforts continued on awarding the installation contract. Currently, the request-for-proposal is out for bid and proposals are pending.

AN Stack Extension

Last update 3/1/2018:

Engineering evaluations, determining the maximum height the existing superstructure can support, and whether there would be a beneficial impact to the work area based on the extension, are in progress.

Strobic® Air Dilution Fan

Last update 3/1/2018:

For factory acceptance testing, WRPS continued to review Strobic® submittals required to support testing. In parallel with submittal reviews, fabrication of the Strobic® unit is currently on-going; shown in **Figure 2** is a Strobic® Air Plenum, and in **Figure 3** is a Strobic® Air Fan. Efforts continue to award the off-site testing contract.

Figure 2. Strobic® Air Plenum

Figure 3. Strobic® Air Fan

NUCON® Thermal Oxidation Vapor Abatement Unit (VAU)

Last update 3/1/2018:

The engineering-scale testing continues to be developed, and the following was accomplished during the reporting period:

- Terragraphics
  - Presented a summary of the revised *Functions and Requirements* document to the Integrated Project Team (IPT). The IPT's comments were incorporated and submitted for an in-house review.
  - Hi-Line completed the skid modifications for the diesel unit.
  - Continued work on the *Technical Demonstration Conceptual Design* for BY-108.
  - Completed a field walkdown of BY-108 to review options for locating the skid and electrical tie-in points.
  - Continued finalizing the *Site Selection Report*.

- NUCON®
  - The diesel generator kit and upgrade kit were shipped to the PNNL test site and a NUCON® technical representative arrived on-site to assist with the start-up of the vapor abatement unit (VAU).
- WRPS
  - Continued efforts to resolve the *Test Plan* comments from the Washington State Department of Ecology. DOE reviewed and concurred with WRPS's responses to the Department of Ecology.
  - Efforts are on-going to transfer two AreaRAE instruments to PNNL in support of the engineering-scale test.
  - During the CVST meeting, the CTO manager provided a status on the engineering-scale test and solicited feedback from the workforce.
- PNNL
  - Continued development of the analytical equipment being used to support the engineering-scale test. Efforts focused on the following:
    - ✓ *Approving the contract to purchase the Fourier-transform infrared spectroscopy (FTIR)*
    - ✓ *Confirming sensitivity limits for various compounds on the proton transfer reaction-mass spectrometry (PTR-MS)*
    - ✓ *Developing pre-concentrator through bench testing, which is being done to help identify methods for analyzing NDMA and furan at low concentrations*
    - ✓ *Configuring chromatography to allow for analyzing various compounds*
    - ✓ *Receiving calibration gases*
  - Continued preparation of equipment and systems needed to support testing activities, including the following:
    - ✓ *Meeting with PNNL electrical subject matter expert (SME) to identify path forward for process heating control strategy*
    - ✓ *Meeting with PNNL pressure systems and fire safety SMEs to identify path forward for compressed gas cylinder storage requirements*
    - ✓ *Starting construction of the injection system*
    - ✓ *Completing piping of the diesel generator to the VAU*
    - ✓ *Starting electrical connections to the VAU and test trailer*
    - ✓ *Completing the draft chemical process permit and initiating the review cycle*
    - ✓ *Completing development of draft operating procedures and submitting for review*
    - ✓ *Attaching stack exhaust*

KPP 5. Administrative Controls and Monitoring

Permanent Installation of VMDS Equipment in A and AP Farms

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.

Update:

Numerous activities were on-going last week including:

- Continuing efforts to obtain approvals on the *Phase 2 Pilot-Scale Report*. The report is currently with WRPS for general counsel review.
- Continuing work on the A Farm coverage maps.
- Preparing the *AX Farm Basis of Design* and *AN Farm Basis of Design*.
- Continuing work on the AP Farm UV-FTIR turnover to Operations including:
  - Development of the *Functions & Requirements* document, with comments incorporated on the draft document.
  - Continued engineering review to specify test gases and starting procurement activities.
  - Continued preparation of the ammonia set point calculation. The 90% draft is complete and is undergoing review.
  - Calculations used to support AP Farm turnover were completed. These calculations included the heat trace verification, sample pump flow verification and heating/cooling verification.
  - Efforts to complete Operational Readiness Checklist items continued.
- Continuing work on the Autosampler modifications, including:
  - Preparing the report summarizing the development and selection of the test gases.
  - Continuing the purchase of the gas standards, heated tube set and gas generator.
  - Preparing the draft test procedure to support integrated testing activities.
  - Preparing design drawings for the test bed manifold and Hanford E-Skid, as well as completing the draft E-Skid testing procedures.
  - Developing the functional requirements for the Autosampler implementation strategy.

Stack and Boundary Monitors

Update:

The ^{3}CEREX® Stack Monitor Procurement contract proposal was submitted and a technical review is being prepared. The AN Farm design package remains in review. The 60% design installation package for the AX Farm continues to be prepared.

Establishing Safe Unrestricted Boundaries

Last update 2/15/2018

Coordinated with ORP, a draft paper, tentatively titled *Comprehensive Vapor Action Plan KPP 5 - Defining the Unrestricted Work Boundary,* was developed clarifying how WRPS will define work boundaries in and around the tank farms. This document provides a regulatory basis for the implementation of the tank farm boundaries moving forward for the IH Program. It is in final review by ORP and WRPS IH program staff. During FY2017, WRPS's subcontractor Kenexis Consulting Corporation completed three quantitative risk assessments (QRA) designed to assess the probability and likely consequences of an episodic, acute exposure. To support these planned QRAs, all comments have been received for the AN-Tank Farm Basis of Design (BOD), and the BOD for the AY/AZ-Tank Farms has been initiated. All laser scans needed to support the AN and AY/AZ QRAs have been completed, and laser scan data analysis has been initiated.

Public Address System

Update:

Prior to turning the east area A, AX, AY, and AZ Farms over to operations, the last speaker, AX-001, required troubleshooting. The troubleshooting work is complete, allowing the turnover to resume. For the west area PA systems, work continued on preparing excavation permits and crossing lists for the S, B, T, and U Farms.

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

Update:

In the last month, it was determined that the TX Farm and TY Farm designs, along with the *SST Stewardship Execution Strategy Document* (FY2015 LEAN Report) would be complete in FY2018, while the TY Farm installation activities would be deferred until FY2019. Since the last CPPO update:

SST Remote Monitoring Equipment:

Efforts continued on the draft *TY Farm Temperature and Surface Level Design* packages. In addition to design activities, all the equipment needed to support temperature and surface level installation was received.

FY LEAN 2015 Report:

Review of the second draft of the *SST Stewardship Execution Strategy Document* has been completed and comment incorporation was started.

KPP 7. Hierarchy of Controls

Cartridge Testing and SCBA Alternatives

Last update 3/1/2018:

Headspace sampling at BY Farm was completed the weekend of February 9, 2018. Cartridge testing at BY Farm is also complete. Sampling at BY 108 and BY 110 completed PAPR and APR testing the weekend of February 24, 2018. Mobilization began at AP Stack.

Figure 4. Headspace sampling at BY Farm, February 2018 ***(Photo courtesy of Ms. Parks-Beyer.)***

Mobile Laboratory

Last update 2/15/2018

During the reporting period, efforts continued on the following:

- R.J. Lee provided a proposal for continuation of the background study. However, the proposal was not responsive to the SOW and was returned to RJ Lee for correction. R.J. Lee submitted a revised proposal for continuation of the background study that was responsive to the SOW and WRPS completed the technical evaluation.
- Met with Procurement and Quality Assurance (QA) to discuss the new Mobile Lab Services contract. The initial discussions with QA indicated that TerraGraphics's QA program may not be mature enough to be awarded the contract. However, subsequent meetings determined that their QA program would probably be acceptable. Although QA and acceptance criteria reviews are still on-going, the current path forward is to complete the requisition.

Key Performance Parameter 7

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

$^{4}C_2$Sense® Personal Vapor Monitor

Last update 3/1/2018:

During the reporting period, the following was accomplished:

- Received and incorporated comments on the draft version of the *C_2Sense® Field Demonstration Test Plan*. The comment responses were accepted by the IPT.

- Considered for evaluation the Industrial Scientific Ventis™ Pro 5 and Dräger Chip-Measurement-System®, two commercially available ammonia detectors technologies. Since neither offered significant advantages over those currently identified for field demonstration, they were rejected. ToxiRAE Pro and GfG Instrumentation G888 are the identified candidates for field demonstrations.
- Built a prototype mounting plate used to support the field demonstration.
- A preliminary version of the C2Sense field demonstration test plan was presented to the IPT and feedback was solicited. The comments were incorporated into the draft test plan and distributed for formal review.
- A market survey was completed, which identified two commercially available, wearable ammonia detectors (with wireless capability) for consideration as candidate technologies to be evaluated in the upcoming field demonstration.

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]Strobic Air is a registered trademark of MPC Inc., Wilmington, Delaware.
[2]NUCON is a registered trademark of Nucon International, Inc., Columbus, Ohio.
[3]CEREX trademark by TECAN SP, INC. Baldwin Park, California.
[4]C_2Sense is a registered trademark by C_2Sense, Inc., Cambridge, Massachusetts.