washington river protection solutions

CPPO Chemical Protection Program Office

The Strobic Air Tri-Stack Ventilator is one of the engineering controls (KPP 4) being developed for potential use at the Hanford site. Fabrication of the Strobic unit is on-going. The equipment will be assembled and undergo factory acceptance testing. Shown are Strobic Air nozzles.

Photo courtesy of Ms. Parks-Beyer

Tank Operations Contract
Chemical Protection Program Office
Weekly Report
March 1, 2018

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

The Office of Enterprise Assessments Follow-up Assessment of Progress on Actions Taken to Address Tank Vapor Concerns at the Hanford Site has been posted and is available Here.

In coordination with the Industrial Hygiene and the Environmental, Safety, Health and Quality (ESH&Q) Chemical Protection Integration Manager, the first five 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 four presentations are in various stages of draft.

CPPO Oversight and Tracking

Table 1. External Assessments Recommendations Status

Report	As of February 28, 2018				
	Total	Validated Complete	Field Work Complete	In Progress	Pending*
TVAT	117	81	7	27	2
OIG	3	3	0	0	0
NIOSH	54	17	14	21	2
EA-32	28	7	5	14	2
CTEH	23	16	2	5	0
VMEP I, II	67	9	12	41	5
Other	69	21	10	29	9
Total	361	154	50	137	20

External Assessments Recommendations Status

The draft Comprehensive Vapors Action Program Recommendations Status (CRS) database tracks the progress of the action items and deliverables that were assigned to the recommendations from third party assessments of the vapors program as shown in **Table 1**. The Problem Evaluation Request (PER)/Electronic Suspense Tracking and Routing System (ESTARS) tracks these actions as being opened or closed. The CRS automatically populates this data into the CRS database reports. The CPPO also tracks the individual status of these action items and deliverables via the CRS database. CPPO populates the CRS, reflecting a more real-time status on individual action items and deliverables. Each action item and its

deliverables are tracked and has a status of **Pending**, **In Progress**, **Field Work Completed**, and **Completed**. **Pending** indicates that the CPPO office has not yet investigated the status of that action item or its deliverables. **In Progress** indicates that an action item is in effect and deliverables have not yet been drafted. **Field Work Completed** indicates that the field work outlined by the action item is completed, but the deliverable is still being drafted. **Completed** indicates that the CPPO validated both the action item and its deliverables are complete.

In February, CPPO validated 19 recommendations/actions as **Completed**, bringing the total number of validated completions from 135 to 154, an increase of 14 percent. An action item may be deemed **Completed**, but this does not necessarily mean that the action is closed in the PER/ESTARS system. The CRS reflects only those action items that the CPPO validated as **Completed**.

Vapors Corrective Action Status

The CPPO tracks all vapor-related PERs, with the goal of communicating PER resolution status. The 120 draft Comprehensive Vapors Action Plan (CVAP) actions are captured in the PERs listed below, including the 3 Office of Inspector General (OIG) actions captured in WRPS-PER-2016-2433 thru 2435. Sixty-three TVAT actions were completed during Phase I (FY2016) and the OIG actions were completed in FY2017; their completions are documented in the ESTARS. The remaining TVAT actions have been rolled into the draft CVAP. The remaining recommendations from National Institute of Occupational Safety and Health (NIOSH), EA-32, Center for Toxicology and Environmental Health (CTEH), and the Vapor Management Expert Panel (VMEP) were added to the PER system and corrective actions launched. **Figure 1**, below, depicts the status of the draft CVAP total corrective actions.

KPP 1 – Engagement and Effective Measurement
- WRPS-PER-2017-2151

KPP 2 and 3 – IH Technical Basis and IH Program
- WRPS-PER-2017-0610
- WRPS-PER-2017-0718
- WRPS-PER-2017-0720
- WRPS-PER-2017-0721
- WRPS-PER-2017-0722
- WRPS-PER-2017-0723

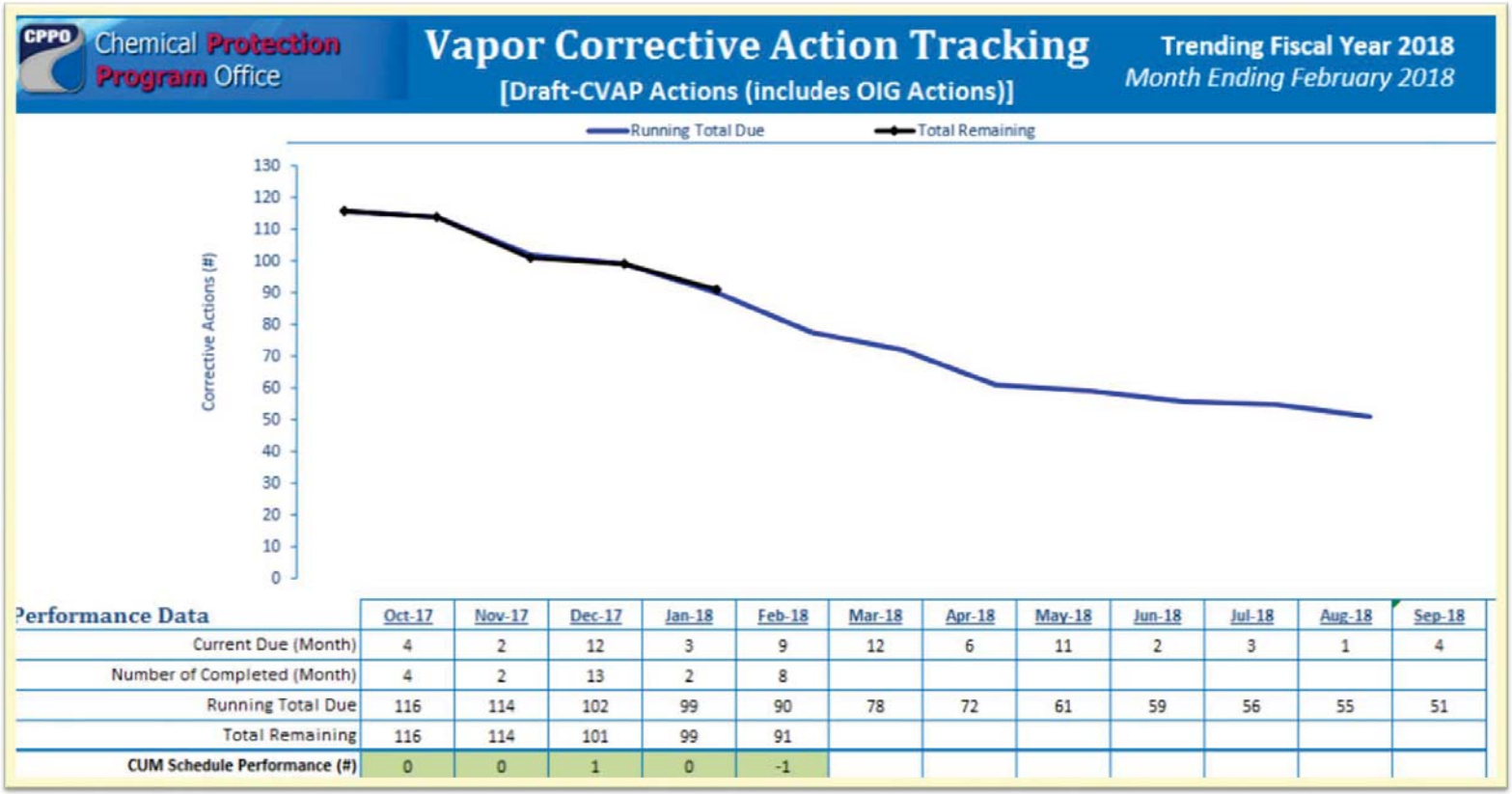
KPP 4 – Engineering Controls
- WRPS-PER-2017-2152 (4A)
- WRPS-PER-2017-2153 (4B)

KPP 5 – Administrative Controls and Monitoring
- WRPS-PER-2017-2154 (5A)
- WRPS-PER-2017-2155 (5B)

KPP 6 – Tank Operations Stewardship
- WRPS-PER-2017-2156

KPP 7 – Hierarchy of Controls
- WRPS-PER-2017-2157 (7A)
- WRPS-PER-2017-2158 (7B)

KPP 8 – Medical Support
- WRPS-PER-2017-1707



Performance Data	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18
Current Due (Month)	4	2	12	3	9	12	6	11	2	3	1	4
Number of Completed (Month)	4	2	13	2	8							
Running Total Due	116	114	102	99	90	78	72	61	59	56	55	51
Total Remaining	116	114	101	99	91							
CUM Schedule Performance (#)	0	0	1	0	-1							

Figure 1. Vapor Corrective Action Status

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Engagement and Effective Measurement

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

The CTEH team began conducting interviews with the workforce 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.

Key Performance Parameter 1

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

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

A CVST Fugitive Emissions (FE) project team meeting was held on February 22, 2018, offering its *CVST-FE Group Initial Investigation Strategy*. Representatives from the Chief Technology Office (CTO), Industrial Hygiene (IH), Industrial Hygiene Technicians (IHT), the Department of Energy (DOE), CPPO, Pacific Northwest National Laboratory (PNNL), WRPS Project Management, WRPS Health and Safety, WRPS Process Engineering, Operations and HAMTC were in attendance. The focus of the meeting was the status of on-going fugitive emissions activities and path-forward options. The presenter guided the attendees through the process used to evaluate historical information, determine data gaps, evaluate test equipment, and determine a viability methodology for performing fugitive emissions investigations. The proposed area is adjacent to 204-AR and 244-AR, and the plan for the initial FE investigations was also presented. After the presentation, numerous questions and feedback were provided by the attendees. One recommendation was that the information be presented at an upcoming CVST meeting, and then reviewed by the CVST committee to determine if the proposed path forward was acceptable. Other recommendations by the participants included publishing a CPPO Notebook and *Solutions* article on FE status, using a pre-concentrator to analyze lower concentrations, and to begin monitoring soon in order to capture what are potentially seasonal emissions.

- Chemical Protection Engagement: Communications

Last week's CPPO Notebook is titled *Industrial hygiene exposure assessment: Risk characterization, Part 1, part 4 of 9, KPP 3.* This week's CPPO Notebook is titled *Industrial hygiene exposure assessment: Quantitative Risk Assessment (QRA), part 5 of 9, KPP 3.*

- Chemical Protection Engagement: Hanford Vapors Website Updates
  - VMDS Weekly Report 03222017_03292017
  - VMDS Weekly Report 005032017_05102017

- 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, the results will be used to drive continued improvement in the vapors-related information provided to the workforce. The analysis and resulting recommendations will be reported to WRPS, ORP, and to the workforce.

- Chemical Protection Engagement: Worker Feedback

  Mr. Jason Vitali petitioned the February 14, 2018, CVST audience for feedback on fugitive emissions, [1]NUCON®, and [2]C[2]Sense® activities, which were forthcoming during the February 22, 2018, CVST Fugitive Emissions meeting. After the presentation, numerous questions and feedback were provided by the attendees. One recommendation was that the information be presented at an upcoming CVST meeting, and then reviewed by the CVST committee to determine if the proposed path forward was acceptable. Other recommendations by the participants included publishing a CPPO Notebook and *Solutions* article on FE status, using pre-concentrator to analyze lower concentrations, and to begin monitoring soon in order to capture what are potentially seasonal emissions.

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

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.

- IH Manual and Technical Basis

  Last update 2/8/2018:

  Sections 1 and 4, *Introduction* and *Tank Waste Chemical Vapors,* of the IH Manual were published on the Industrial Hygiene website, and 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*

  The *Industrial Hygiene Chemical Vapor Technical Basis Program Plan* "provides a method and process for reviewing, summarizing, updating, and implementing the

Hanford Tank Farm Industrial Hygiene Chemical Vapor Technical Basis "(TFC-PLN-174, pg. 2).
Briefings with line organization, all-hands meetings, newsletters, required reading, and other communication avenues have been utilized to communicate the changes to the exposure assessment process, vapors management strategies in the tank farms, and the changes to the IH Technical Basis. IH is continuing to develop IH Manual sections.

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).

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.

Maintain Industrial Hygiene Program and Institutionalize Vapor Program Requirements

Update:

Training bulletin TB-18-01, *The New Chemical Worker Training Program,* was issued to WRPS as required reading on January 15, 2018. The bulletin introduced *Chemical Worker Tier Training*s. Determining that a "tiered approach to training is more effective because less time is spent in training that is not needed for your job requirements," WRPS created three tiers of training and its commensurate refresher courses. *Tier 1: General Chemical Awareness Training*, targets all WRPS workers and is available as a standalone computer based training (CBT) for other Hanford Contractors. *Tier 1*, available since September 2017, covers general

chemical and odor awareness. *Tier 2* was published this month. It targets all WRPS workers located past the Wye Barricade, is a CBT, and *Tier 1* is its prerequisite. *Tier 3,* which targets workers who enter the tank farms, is now complete and implemented. The feedback to date has been very positive.

- Central Residence for Industrial Hygiene Technicians (IHT)

Last update 2/15/2018:

Retrieval Industrial Hygiene Technicians (IHT) and their first-line supervisors will be relocated to a centralized mobile office (MO) building. 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. The installed and occupied MO will satisfy KPP 3 for retrieval IHTs. The trailer site is at 60% completion. The trailer design was approved by Washington State Labor and Industries.

- Air Dispersion Modeling

Last update 1/25/2018:

The Dispersion Modeling project team is currently working on Air Pollutant Graphical Environmental Monitoring System (APGEMS) regression tests and test cases; the model updates are complete, but modifications continue as they perform tests and identify fixes or opportunities for improvements, mostly in the software and graphic user interface (GUI). They are also drafting a report to summarize the model, capabilities, limitations, and to provide a quick users guide.

KPP 4. Engineering Controls

Key Performance Parameter 4

Complete engineering control concept demonstrations for [1]Strobic Air Tri-Stack® and 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

Update:

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

AN Stack Extension

Update:

Engineering evaluations to determine the maximum height the existing superstructure can support are in progress, as is the determination if the extension would have a beneficial impact to the work area.

[3]Strobic® Air Dilution Fan

Update:

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)

Update:

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

Last update 2/22/2018:

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.

Numerous activities were on-going last week including:

- Efforts to obtain approvals on the *Phase 2 Pilot-Scale Report* continue. The report is currently with WRPS for general counsel review.
- Efforts are on-going to determine the funding and resources needed to prepare the document that will be used to support VMDS technology development.
- Work has started on the A Farm coverage maps.
- Work continues on preparing the *AN Farm Basis of Design*.
- Work continued 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.
  - Calculations used to support AP Farm turnover were started. These calculations included the heat trace verification, sample pump flow verification and heating/cooling verification.
  - Efforts to complete Operational Readiness Checklist items continued.
- Work continued on Autosampler modifications, including:
  - Preparing the report summarizing development and selection of test gases.
  - Procuring test gases.
  - Preparing the test procedure that will be used to support integrated testing activities.
  - Completing the test plan that will be used to support integrated testing activities.
  - Procuring items needed to support assembly of the Autosampler.
  - Preparing design drawings for the test bed manifold and Hanford E-Skid.
  - Completing of manifold testing procedures.
  - Developing the functional requirements for the Autosampler implementation strategy.

Stack and Boundary Monitors

Last update 2/22/2018:

The ^{4}CEREX® stack monitor support contract proposal was submitted and a technical review is being prepared. The AN Farm and AZ Farm design package reviews continued. The statement-of-work for installing the stack monitor is being finished.

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

Last update 2/22/2018:

Prior to turning the east area A, AX, and AY Farms over to operations, the last speaker, AX-001, required troubleshooting. Work also continued on activities necessary to turning over the second set of PA systems, AP, C, AN, and AW Farms, to operations. PA systems work continued in the west, including preparing excavation permits and crossing lists for the S, B, T, and U Farms.

KPP 6. Tank Operations Stewardship

Pilot SST Stewardship Program

Last update 2/8/2018:

SST Remote Monitoring Equipment:

Efforts continued on the draft TY Farm temperature and surface level design packages, which are nearing completion. In addition to design activities, the majority of the equipment needed to support temperature and surface level installation was received. The *Plant Forces Work Review* to determine who performs installation activities was submitted for review and awarded to Construction forces.

FY LEAN 2015 Report:

The second draft of the *SST Stewardship Execution Strategy Document* is currently under review.

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.

KPP 7. Hierarchy of Controls

Cartridge Testing and SCBA Alternatives

Update:

Headspace sampling at BY Farm was completed the weekend of February 9, 2018. Cartridge testing at BY Farm is also complete. Sampling at BY 018 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:

- Completing and accepting technical evaluation to support the spring background study. RJ Lee will be awarded the contract.
- Establishing grading criteria for the competitive procurement of the new PTR-MS mobile laboratory and initiating procurement activities.

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_2Sense® Personal Vapor Monitor

Update:

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 [5]Industrial Scientific Ventis™ Pro 5 and [6]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. Along with the C_2Sense® monitor, the ToxiRAE Pro and GfG Instrumentation G888 are the identified candidates for field demonstrations.

KPP 8. Medical Support

Key Performance Parameter 8
Support medical program enhancements in conjunction with responsible Hanford Site organizations and establish update to WRPS process/procedures.

- Expanding WRPS Employee Awareness of the Medical and Company Return to Work Processes:

  Last update 2/8/2018: A meeting was held with HAMTC and building trades representatives, during which it was agreed to eliminate the ACE's exclusion note in TFC-BSM-HR_EM-C-10, Reasonable Accommodations procedure and replace it with, "[e]mployees with minimal or no symptoms and a normal exam may be returned to work with or without restrictions while lab test results are pending." The HAMTC Safety Lead agreed to take this to the HAMTC President for his concurrence. Once an agreement is reached, a communication plan will be developed and delivered to the workforce.

- Expanding Hanford Worker's Awareness of Existence and Role of the Washington State Labor & Industries (L&I) Office of the Ombudsman for Injured Workers of Self-Insured Businesses:

  Last update 2/8/2018:

  Meetings will be scheduled on-site and in town with the Office of the Ombudsman to expand the workers' awareness of the existence and the role of the Ombudsman office. This will be the second series of meetings offered to the Hanford workers. The communication and schedule will be coming from DOE/RL in the next few days so that each contractor can communicate it to their workforce.

[1]NUCON is a registered trademark of Nucon International, Inc., Columbus, Ohio.
[2]C_2Sense is a registered trademark by C_2Sense, Inc., Cambridge, Massachusetts.
[3]Strobic Air is a registered trademark of MPC Inc., Wilmington, Delaware.
[4]CEREX trademark by TECAN SP, INC. Baldwin Park, California.
[5]Ventis™ Pro5 Multi-Gas Monitor is a registered trademark by Industrial Scientific in Pittsburgh, Pennsylvania.
[6]Dräger Chip-Measurement-System® is a registered trademark by Drägerwerk AG & Co. Register of Companies Number: HRB 7903 HL.