



washington **river**
protection solutions



The central residence for the Industrial Hygiene Technicians is in the 200 east area on 4th Street near 218A across from PUREX. The site was cleared and grubbed a couple of weeks ago; the new formwork testifies to the steady progress towards installing the 10-Wide trailer. (Photo courtesy of C. Holst, July 2018.)

Tank Operations Contract
Chemical Protection Program Office
August 2, 2018

1. CHEMICAL PROTECTION PROGRAM OFFICE (CPPO) ACTIVITIES STATUS

CPPO interns, focused on continuing improvement, 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

External Assessments Recommendations Status

The recommendations status columns in Table 1 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 has validated deliverable(s) 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.

Table 1. External Assessments Recommendations Status

Report	As of July 31, 2018				
	Total	Validated Complete	Field Work Complete	In Progress	Pending
TVAT	117	92	9	16	0
OIG	3	3	0	0	0
NIOSH	54	25	10	19	0
EA-32	31	16	5	10	0
CTEH	23	21	0	2	0
VMEP I, II	67	24	9	34	0
Other	74	38	5	31	0
Total	369	219	38	112	0

External Assessments Recommendations Status

Significant progress has been made to address these recommendations. CPPO has validated that 70% of the recommendations have been addressed by actions/deliverable that are either **Complete** or **Field Work Complete**. Of the 369 total recommendations:

- 60% have been verified **Complete** and are closed.
- 10% are verified as **Field Work Complete** and are awaiting final deliverables (i.e. documentation) to close.
- 30% have ongoing actions and are **In Progress**.
- There are no **Pending** recommendations.

Vapors Corrective Action Status

The CPPO tracks vapor-related Problem Evaluation Requests (PER), with the goal of communicating PER resolution status. The performance data in **Figure 1** below are defined as follows:

- Current Due (Month) – Current corrective actions due for the month
- Number of Completed (Month) – 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 completed compared to the Running Total Due.

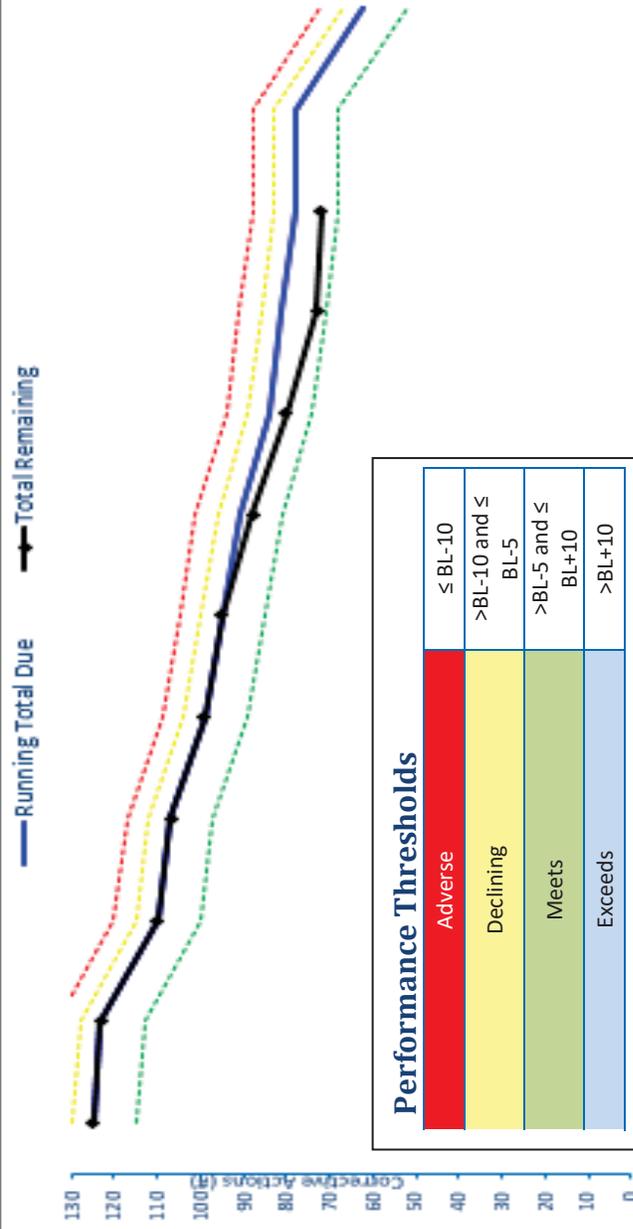
The 128 draft CVAP actions are captured in the PERs listed in **Figure 1** below, including the 3 Office of Inspector General (OIG) actions captured in WRPS-PER-2016-2433 thru 2435, and 5 Office of River Protection (ORP) Facility Representative Surveillance (17173-TF) actions captured in WRPS-PER-2018-0551 thru 0554. Sixty-three TVAT actions were completed during Phase I (FY2016) and the OIG actions were completed in FY2017; its completions are documented in the Electronic Suspense Tracking and Routing System (E-STARS). The remaining TVAT actions have been rolled into the draft CVAP. The 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. This month, two corrective action due dates were extended outside the FY2018 reporting period. **Figure 1** depicts the status of the draft CVAP total corrective actions and shows that 6 actions this fiscal year were completed ahead of schedule. There are no corrective actions due in August, hence the running total of outstanding actions is 76. These 76 will be worked off over the next 12 months.

Vapor Corrective Action Tracking

[Draft-CVAP Actions (includes OIG Actions)]

Trending Fiscal Year 2018
Month Ending July 2018

- 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 Thresholds	
Adverse	≤ BL-10
Declining	>BL-10 and ≤ BL-5
Meets	>BL-5 and ≤ BL+10
Exceeds	>BL+10

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)	3	2	13	3	8	4	4	7	3	3	0	16
Number of Completed (Month)	3	2	13	3	8	4	7	8	7	1		
Running Total Due	125	123	110	107	99	95	91	84	81	78	78	62
Total Remaining	125	123	110	107	99	95	88	80	73	72		
CUM Schedule Performance (\$)	0	0	0	0	0	0	3	4	8	6		

Figure 1. Vapor Corrective Action Tracking July 2018

2. COMPREHENSIVE VAPOR ACTION PLAN Key Performance Parameters

KPP 1. Engagement and Effective Measurement

CTEH

Update:

Toxicologists Mike Lumpkin and Pamela Tijerina were the CTEH representatives on-site last week. The Toxicologists met with an expert from 222-S Lab to gather details about the analytical chemistry methodology used to develop the inventory of known tank headspace chemicals. Discussions were also held regarding new technologies to characterize the tank vapors. CTEH met with SMEs from HPMC to discuss the direction of CTEH research into clinical biomarker data that may be informative for HPMC clinical and risk communication efforts. Drs. Pamela Tijerina and Mike Lumpkin met with a group of approximately 20 tank farm workers who had just finished the Chemical Worker Tier III training. The toxicologists introduced the mission of CTEH onsite, and fielded toxicology and health risk-related questions from the workers. CTEH are developing Notebooks on leading indicators and tank vapors characterization.

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

Chemical Protection Engagement: Communications

Update:

Last week's CPPO Notebook is titled *Response to Odors at the Hanford Tank Farms* developed by a CPPO SME.

Solutions, Issue 445, published July 23, 2018, pointed its readers to the four-part CPPO Notebook covering toxicology and industrial hygiene fundamentals.

Chemical Protection Engagement: Chemical Vapors Solutions Team (CVST)

The CVST New Technology Sub-team held a meeting on July 25, 2018. Representatives from CTO, CPPO, NCOs, IH Technicians, and IH Programs were in attendance. The team leader reviewed the charter, picking up the conversation from the last sub-team meeting during which feedback had been requested on how to modify or improve the charter. Although the sub-team believed the charter covered all the major issues like mission, function, and membership, the main feedback was on determining methods for implementing the charter. The main recommendation was that the charter be reviewed and approved by the CVST voting members to help ensure its implementation, namely that all vapor related

equipment be evaluated by the CVST New Technology Sub-team prior to its acquisition.

The CVST Voting Members meeting was held on July 25, 2018. For more on this worker engagement activity, see [Worker Feedback](#).

Chemical Protection Engagement: Hanford Vapors Website Updates

- [July 19, 2018 - CPPO FY18 3rd Quarter Report](#)
- [CVST Agenda - July 11, 2018](#)
- [CVST Agenda - May 9, 2018](#)

Chemical Protection Engagement: Workforce Engagement Update:

The Chemical Protection Program Office (CPPO) has decided to suspend site briefings for the remainder of FY2018 to allow the workforce to focus on completing end-of-the-year commitments. The tentative plan is to re-start the vapors-related workforce site briefings at the beginning of FY2019.

Chemical Protection Engagement: Worker Feedback

A meeting was held on July 25th with members of the CVST voting team in attendance. Presentations on Exposure Assessments (EA) and Personal Monitoring Implementation (PMI) were given at the meeting. The EA presentation focused on the process for developing the assessment and provided updates on the A, AP and AW-Farm EA. Attendees asked numerous questions on the scenarios reviewed for the assessments and the chemicals selected for review, which were answered satisfactorily by the presenter. The PMI presentation focused on the rollout of the ToxiRae Pro personal monitors, of which approximately 300 have been ordered. The monitors are tentatively scheduled to arrive in August. The voting members had many questions on alarm limits, time stamping, equipment check out and data download and charging. The presentations were followed up with discussions on topics for the next CVST and CVST voting member meetings.

KPPs 2 and 3. IH Technical Basis and IH Program

IH Manual and Technical Basis

Update:

Since the beginning of the 4th Quarter, the TOC-IH-58435, *Industrial Hygiene Manual's* updated sections expanded to include Section 5, *Reporting Occupational Exposure, and Medical Monitoring*, which is now on the Industrial Hygiene webpage on the Intranet. Section 6 is renamed and

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.

repurposed and is now titled *Work Control*. It is in draft review with DOE ORP. Section 7, *IH Program Administration*, is drafted, and is in internal WRPS review. Section 8, *Documents and Records*, is also in draft and in internal WRPS review. TFC-PLN-173, *Use of FFAPR in Actively Ventilated Tank Farms*, is posted on the website for implementation in SY and AP Farms. It is being edited to include AN Farm.



Figure 2. Industrial Hygiene has posted IH Manual Section 5 to the IH Intranet.

The Industrial Hygiene organization is reporting 100% of the IH workforce has been trained in *Risk Communication Techniques* and ~100% trained in *Crucial Conversations*.

✦ Health Process Plan (HPP)

Update:

The following HPP studies conducted by PNNL have been released as final versions under the TFC-Charter-71 process: *Proposed OELs for Chronic Exposures – COPCs with Regulatory Guidelines*, *Hanford Tank Vapors FY 2017 Chemicals of Potential Concern Update*, and *Proposed OELs for Chronic Exposures – Nitrile Class COPCs and 2,4-Dimethylpyridine*, *Proposed Acute Exposure Limits for COPCs with Regulatory Guidelines and Recommendations for Sampling and Analysis of Hanford Waste Tank Vapors*. 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 Charter 71 process. They are *Proposed Risk-Based Approach for Nitrosamine Chemical of Potential Concern* and *Proposed Occupational Exposure Limits for Furans*. One study is in internal review by PNNL prior to release as final versions: *Sampling and Analysis Recommendations*.

✦ Air Dispersion Modeling

Update:

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

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.

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. WRPS Engineering and IH are evaluating the software and providing feedback to the PNNL team. Representatives from Process Engineering and CTO Fugitive Emissions team were trained in the use of APGEMS-TF Version 1.1 last week.

✦ Central Residence for Industrial Hygiene Technicians (IHT)

Last update 7/26/2018:

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.

KPP 4. Engineering Controls

✦ A Farm Exhausters

Last update 7/26/2018:

Exhausters: Over the last two weeks, crews assembled and completed the exhauster slab concrete forms in the A Farm. 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 3. Exhauster Slab Concrete Forms for A Farm Exhauster (Photo courtesy M. Allen.)



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.

AW Stack Extension

Last update 7/26/2018:

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.

AN Stack Extension

Last update 7/26/2018:

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

¹Strobic® Air Dilution Fan

Last update 7/26/2018:

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 in this quarter.
- Efforts started on evaluating the test results and data.

²NUCON® Thermal Oxidation Vapor Abatement Unit (VAU)

Last update 7/26/2018:

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 for 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 incorporating WRPS's comments into the draft test report.

KPP 5. Administrative Controls and Monitoring**✦ Permanent Installation of VMDS Equipment in AP****Farm****Update:**

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 continue, including the following:

- Approval of the uncertainty evaluation (RPP-RPT-60669).
- 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. The third OAT addresses startup activities where gas testing is required. A status for each OAT is provided below:
 - **Interim Reliability OAT:** The OAT was reviewed by the Joint Test Group and Joint Test Working Group committee and their comments are currently being resolved.
 - **No-Gas Testing OAT:** The draft OAT has been prepared and is awaiting a Joint Test Working Group review.
 - **Gas Testing OAT:** The draft OAT is currently being prepared.
- Efforts also continued on installing the bottle rack, troubleshooting the new flowmeter to resolve leak issues, procuring a vendor for calibration support, and receiving equipment (calibration gases, permeation tubes).

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.

✦ Stack and Boundary Monitors**Update:**

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. Activities since the beginning of July include the following:

- Fabrication and factory acceptance testing of the Ultra Violet Differential Optic Absorption Spectrometry (UV-DOAS) units. WRPS

sent representatives to the subcontractor's facility to support testing activities.

- Site preparation work for installation of the 702AZ and AN-Farm stack monitors.
- Approval and release of the AW Farm stack monitor design package, and preparation of the draft work package for field installation, which is currently under review.
- Approval and release the AX Farm stack monitor design package, and preparation of the draft work package for field installation.

Establishing Safe Unrestricted Boundaries

Update:

Signs have been prepared to identify the Industrial Area, Exclusion Zone, and Contamination Reduction Zone. Signs will not be prepared to identify the Support/Administrative Zone or Site Boundary. Meetings have been held with other site representatives informing them of the pending changes to farm signage.

Public Address (PA) System

Update:

Activities performed in the last couple of weeks 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). Efforts are focused on resolving switch and filter issues.
- Continued efforts for the next set of PA systems (B, S, T and U-Farms). Fieldwork at T and U Farm complexes was completed (excavation, trenching, wiring, and conduit installs). The excavation and conduit installations were completed at B-Farm and wire termination was started.

KPP 6. Tank Operations Stewardship

Pilot SST Stewardship Program

Update:

Activities completed during the last couple of weeks include:

SST Remote Monitoring Equipment:

Comments on the 60% TX Farm package have been resolved and the final design package is in review. In addition to the design package, Mission Support Alliance, after resolving contractual issues with their subcontractor, started site mobilization activities to support network and installation activities.

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:

IH attended meetings with the CVAP management to discuss the status of SCBA alternatives. Cartridge testing has been completed for FY2018, and the SX-101 and SX-104 APR and PAPR reports have been issued. The BY sampling data is being analyzed by PNNL. The headspace comparison/line-loss project data is being analyzed as well.

+ Mobile Laboratory

Last update 7/26/2018:

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.

Key Performance Parameter 7

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



Figure 4. PTR-MS Unit for the New Mobile Laboratory (Photo courtesy of G.Weeks.)



Figure 5. Picarro Ammonia Analyzer for the New Mobile Laboratory (Photo courtesy of G. Weeks.)

+ Personal Vapor Monitor

Update:

Phase 1 of the ³C₂Sense[®] ammonia detector field testing is complete. Data from the ⁴ToxiRAE Pro, ⁵Ventis™ Pro V, and the ⁶GfG Micro IV instruments was successfully collected and downloaded. The data is being analyzed. For a detailed description of the testing, see the CPPO 3rd Quarter Summary found [here](#).

A work package is being developed for Phase 2 of the personal vapor monitoring device testing in which personal vapor monitoring devices will measure ammonia concentrations from gas from the AP Stack. The personal vapor monitoring devices will be located in the mobile laboratory. Terragraphics is developing the test apparatus configuration details.

IH has purchased ToxiRAE Pro units for use in the field.



Figure 6. CPPO Intern Tony Brenneman displays the ToxiRAE Pro personal ammonia sensor.

KPP 8. Medical Support

The scope of KPP-8 is to support RL medical program enhancements in conjunction with other Hanford Site organizations. **The last update from HPMC was April 12, 2018, for the 2nd Quarter.**

During the 2nd Quarter:

- The Office of the Ombudsman visit was cancelled. No new visit has been confirmed.
- Discussions continue between the HAMTC President and committee related to revising the Access Control Entry System (ACES) exclusion note in the TFC-BSM-HR_EM-C-10, Reasonable Accommodations procedure. No agreement has been reached as of the date of this publication.
- HPMC confirmed that they are currently working on the epidemiology study comparing Tank Farm Vapor Exposures and Non-Exposed Group of Hanford Workers.

Key Performance Parameter 8

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

¹Strobic Air is a registered trademark of MPC Inc., Wilmington, Delaware.

²NUCON is a registered trademark of Nucon International, Inc., Columbus, Ohio.

³C₂Sense is a registered trademark by C2Sense, Inc., Cambridge, Massachusetts.

⁴RAE Systems by Honeywell, San Jose, California.

⁵Ventis™ Pro5 Multi-Gas Monitor is a registered trademark by Industrial Scientific in Pittsburgh, Pennsylvania.

⁶GfG Micro IV Single Gas Detector from GfG Instrumentation, Inc.