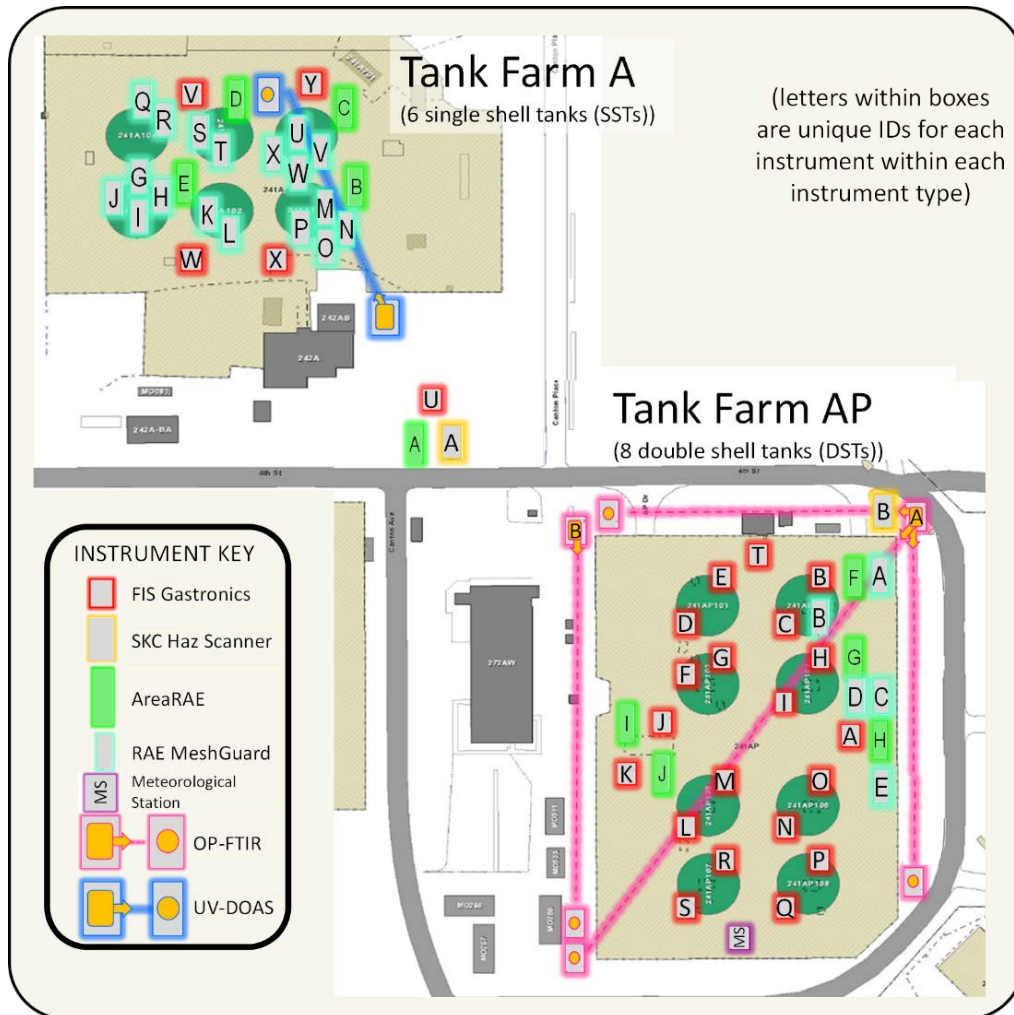


Direct Reading Instrumentation Weekly Summary

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Sampling Location –A & AP-Tank Farms (map below)



This summary contains Vapor Monitoring and Detection System (VMDS) pilot-scale data collected over one week (October 26th at 6:00 a.m. through November 2nd at 6:00 a.m.) using direct reading vapor detection instruments. Pilot-scale testing is focused on evaluating component integration and functionality. Data shown may include results for calibration and calibration check (bump test) tests performed to verify sensors are functioning; these tests are visible in the data as spikes. Any direct reading instrument alarms occurring during pilot-scale testing are taken to be actual events and the appropriate actions/notifications are undertaken.

- Abbreviations:
- NH₃ = ammonia
 - CO = carbon monoxide
 - CO₂ = carbon dioxide
 - LEL = lower explosive limit
 - NO = nitric oxide
 - N₂O = nitrous oxide
 - NO₂ = nitrogen dioxide
 - VMDS = Vapor Monitoring and Detection System
 - VOC = volatile organic compounds, which include both volatile and semi-volatile compounds.

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Weekly Summary:

The ToxiRAE and MultiRAE instruments are personal monitors and were not deployed for use during this week. The AreaRAE systems were taken offline to address calibration issues and did not report data during this week¹. RAE MeshGuards have sensors for ammonia and reported data. No ammonia was detected by the RAE MeshGuards during this week.

Gastronics instruments have sensors for NH₃, VOCs and N₂O. No ammonia was detected by Gastronics instruments.

VOC sensors were replaced during the past week. Only 512A and 512U VOC sensors have been calibrated, so VOC data are valid for only those two units. No VOCs were detected by these two units except during calibration. Immediately after replacing sensors and re-starting the units, the sensors reported transient elevated readings that are considered to be invalid data. Sensors on the remaining 23 units will be calibrated over the next several days as access to the tank farms is allowed. A total VOC limit of 2 ppm currently is employed by the Industrial Hygiene Program Technical Basis²

The N₂O sensors on 512 instruments in AP Farm (512A – 512T) were recently re-calibrated and will be observed for a period to determine whether the instruments will hold calibration. The N₂O sensors on the 512 instruments have been difficult to keep in calibration and the calibration procedure for the N₂O sensor/transmitter was modified to correct for transmitter output drift. The N₂O data will remain suspect until the stability of the sensor and calibration can be confirmed. N₂O has not been detected above background levels (0.3 to 0.4 ppm) by spectroscopic instruments along the fencelines around the farm.

November 30th – December 7th 2016 Observations By Instrument:

HazScanner (501) – The HazScanners, 501A and 501B, have not been calibrated, and work is ongoing to complete their configuration. Therefore no data is presented from these instruments – other than up-time.

AreaRAE (502) – Not reporting during this week.

¹ Note that instrument tags (labels) reported in OSI PI and often presented in weekly summary information are captured directly from OSI PI and that all gas monitoring instruments begin with 200-GM, followed by the target analyte (such as NH₃), followed by the instrument type (three digit number), and the instrument unit as sequential letters. For example, "200-GM-NH3-512C" is an ammonia sensor reporting from Gastronics (denoted as "512") instrument "C".

² RPP-22491, Rev 1, "Industrial Hygiene Chemical Vapor Technical Basis": <http://hanfordvapors.com/wp-content/uploads/2016/10/Industrial-Hygiene-Chemical-Vapor-Technical-Basis-RPP-22491 - Rev 1.pdf>

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Table 1. AreaRAE Comments.

Compound (units)	Comment	OEL	Action Level	Detection Range
CO (ppm)	No data reported.	50	25	1 – 500
LEL (%)	No data reported.			0 – 100
NH ₃ (ppm)	No data reported.	25	12.5	1 – 50
Oxygen (%)	No data reported.		<19.5	1 - 30
VOC (ppm)	No data reported.		2	1 - 200

ToxiRAE (503) – Not used during this week.

Table 2. ToxiRAE Comments.

Compound (units)	Comment	OEL	Action Level	Detection Range
VOC (ppm)	Not in use.	N/A	2	0.1 - 2000

MultiRAE (504) – Not used during this week.

Table 3. MultiRAE Comments.

Compound (units)	Comment	OEL	Action Level	Detection Range
CO (ppm)	A – Not in use. B – Not in use. C – Not in use.	50	25	0 – 500
LEL (%)	A – Not in use. B – Not in use. C – Not in use.	N/A		0 – 100
NH ₃ (ppm)	A – Not in use. B – Not in use. C – Not in use.	25	12.5	1 – 500
Oxygen (%)	A – Not in use. B – Not in use. C – Not in use.		<19.5	1 – 30
VOC (ppm)	A – Not in use. B – Not in use. C – Not in use.	N/A	2	0.1 – 5000

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RAE MeshGuard (505) – Ammonia detection instruments located in A Tank Farm (18 sensors) and located in AP Tank Farms (4 sensors).

Table 4. RAE MeshGuard Comments.

Compound (units)	Comment	OEL	Action Level	Detection Range
NH ₃ (ppm)	Instruments reporting: A, C, D, F, G, H, J, M, N, O, P, Q, T, U, V, W, and X. <ul style="list-style-type: none"> No ammonia detected. Calibration/check tests: None due to limited access to tank farm 	25	12.5	1 – 50

FIS-Gastronics (512) – Monitor for ammonia, volatile organic compounds, and nitrous oxide.

Table 5. Gastronics Comments.

Compound (units)	Comment	OEL	Action Level	Detection Range
NH ₃ (ppm)	No ammonia reported on any instrument (other than calibration tests)	25	12.5	1 – 500
VOC (ppm)	<ul style="list-style-type: none"> Instruments in calibration: 512A and 512 U (see text above) Instruments that reported a maximum value of ≤ 2 ppm: None. Instruments that reported maximum values > 2 ppm: None. 	N/A	2	0 – 1000
N ₂ O (ppm)	N ₂ O sensors reporting from 512E, F, G, H, I, K, M, N, O, P, Q, and T. The N ₂ O sensors on the 512D, G, I, K, M, N, and P reported recurring N ₂ O spikes. The N ₂ O data remain suspect until the stability of the sensor and calibration can be confirmed.	50	25	0 – 1000

November 30th – December 7th 2016 Instrument Operational Status:

Time reporting is calculated using the time sensors are reporting to OSI PI System³ for each instrument:

Table 6. HazScanner (501) % Time Reporting by Instrument.

Instrument	% Time Reporting	Instrument	% Time Reporting
501A	0	501B	35

³ OSI PI System is a data visualization software package from [OSIsoft](http://www.osisoft.com).

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Table 7. AreaRAE (502) % Time Reporting by Instrument.

Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting
502A	0	502D	0	502G	0	502J	0
502B	0	502E	0	502H	0		
502C	0	502F	0	502I	0		

Notes: % time reporting is estimated on review of graphs from OSI PI.

**Table 8. ToxiRAE (503) % Time Reporting by Instrument.
(personal monitors only used when operators are in the field)**

Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting
503A	0	503E	0	503I	0
503B	0	503F	0	503J	0
503C	0	503G	0	503K	0
503D	0	503H	0		

**Table 9. MultiRAE (504) Time Reporting by Instrument.
(personal monitors only used when operators are in the field)**

Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting
504A	0	504B	0	504C	0

Table 10. RAE MeshGuard (505) % Time Reporting.

Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting
505A	84	505H	93	505O	94	505V	94
505B	0	505I	0	505P	94	505W	92
505C	84	505J	94	505Q	94	505X	94
505D	85	505K	0	505R	3		
505E	0	505L	0	505S	0		
505F	83	505M	90	505T	94		
505G	94	505N	92	505U	94		

Table 11. Gastronics (512) % Time Reporting by Instrument.

Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting	Instrument	% Time Reporting
512A	58	512H	47	512N	18	512T	29
512B	0	512I	29	512O	62	512U	100
512C	31	512J	0	512P	20	512V	0
512D	57	512K	75	512Q	0	512W	0
512E	93	512L	36	512R	0	512X	0
512F	96	512M	27	512S	0	512Y	0
512G	26						

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