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WP 12-VC3209

Revision 13

VOC Monitoring and Hydrogen/Methane Process Evaluation, Validation, and Notification

Technical Procedure

EFFECTIVE DATE: 12/29/10

Rick Salness

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TABLE OF CONTENTS

CHANGE HISTORY PAGE 3

INTRODUCTION 4

REFERENCES 5

EQUIPMENT LIST 6

PERFORMANCE 6
1.0 EDD REVIEW 6
2.0 VOC DATA VALIDATION 6
3.0 HYDROGEN AND METHANE DATA VALIDATION 12
4.0 ASSOCIATED DATA HANDLING 16
5.0 SAMPLE LINE FAILURE EVALUATION 19
6.0 NOTIFICATION PROCESS 22
7.0 COMPLETENESS REPORTS 23
8.0 TIC EVALUATION 24

Attachment 1 - Data Validation Checklist 25

Attachment 2 - Hydrogen and Methane Data Validation Checklist 29

Attachment 3 - Electronic Data Deliverables 32

Attachment 4 - Logic Diagram for Evaluating Sample Line Loss 33

Attachment 5 - Regulatory Limits 34

Attachment 6 - Example Meteorological Data Summary Spreadsheet 35

Attachment 7 - Example Air Conversion Spreadsheet 36

Attachment 8 - Pressure Comparison Between Field and Lab Receipt 37

Attachment 9 - Data Qualifier Definition 38

Attachment 10 - Alternate Total Ventilation Average Worksheet 39

Attachment 11 - Notification of TIC Concentrations Found in 10% of Samples Collected 40

CHANGE HISTORY PAGE

REVISION NUMBER	DATE ISSUED	DESCRIPTION OF CHANGES
12	07/15/10	Added last two bullets to Equipment List Removed wording in Steps 4.1.2 [N], 4.1.4 [A], 4.1.4 [B], and 4.1.8 referencing Attachments and put in title instead Added word Example to the title for Attachment 6 and 7 and put in watermark with same on attachments Removed columns 3 and 4 from first table of Attachment 5 Defined ppmv under third table of Attachment 5 Removed reference to Temporary COCs and redundant units column Replaced COC values for carbon tetrachloride with updated values.
13	12/29/10	Changed carbon tetrachloride measurements in Attachment 5 HWFP Repository Concentrations of Concern

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INTRODUCTION

This is a multiple-part procedure for the collection, review, and validation of data used in support of volatile organic compound (VOC) monitoring and hydrogen/methane monitoring. This procedure also provides for the evaluation of sample line loss and notifications of program and/or system conditions.

Section 1.0 provides instructions on how to review electronic data deliverables (EDDs).

Section 2.0 provides instructions on VOC data validation. This activity shall be performed by a technically trained person (Associate Scientist or higher) familiar with the methodology used to analyze the samples.

Section 3.0 provides instructions on hydrogen and methane data validation. This activity shall be performed by a technically trained person (Associate Scientist or higher) familiar with the methodology used to analyze the samples.

Section 4.0 provides instructions for associated data handling including data collection for the normalization of airflow and sample pressure/vacuum comparisons.

Section 5.0 provides instructions for determination and evaluation of sample line loss.

Section 6.0 provides instruction for notifications to communicate sample line loss and concentration of concern exceedances.

Section 7.0 provides instruction on development and completion of Sample Completeness Reports.

Section 8.0 provides instruction on the evaluation of Tentatively Identified Compounds (TICs).

When items do not conform to contract laboratory program (CLP) guidelines, it will be necessary to refer to the U.S. Environmental Protection Agency (EPA) Functional Guidelines. The decision to use data not passing criteria will be solely to expedite activities requiring use of the data. Use of data not meeting all specified criteria does not indicate full acceptance of those data. The laboratory submitting the data may be required to reanalyze or resubmit data for that sample. In all cases, the final objective of the validator is to obtain technically valid data that are defensible and documented.

Performance of this procedure generates the following record(s), as applicable. Any records generated are handled in accordance with departmental Records Inventory and Disposition Schedules.

- Attachment 1, VOC Data Validation Checklist
- Attachment 2, Hydrogen and Methane Data Validation Checklist
- Attachment 3, Electronic Data Deliverable Review and Data Package Validation Table

- Email cover and Excel EDD printout
- Attachment 6, Example Meteorological Data Summary
- Attachment 7, Example Air Conversion Logbook Sheet
- Attachment 8, Pressure Comparison Sheet
- Attachment 10, Alternate Total Ventilation Worksheet
- Attachment 11, Tentatively Identified Compound Notification Sheet
- Completeness Reports (Monthly and Annual)

All records are to be maintained according to the VOC Monitoring Program Records Inventory and Disposition Schedule.

REFERENCES

BASELINE DOCUMENTS

- EPA 540/R-94-085, *Draft Contract Laboratory Program Statement of Work, Volatile Organics Analysis of Ambient Air in Canisters*
- EPA-540/R-99-008, *Contract Laboratory Program National Functional Guidelines for Organics Data Review*
- WP 12-VC.01, Confirmatory Volatile Organic Compound Monitoring Plan
- WP 12-VC.02, Quality Assurance Project Plan for Confirmatory Volatile Organic Compound Monitoring
- WP 12-VC.03, Hydrogen and Methane Monitoring Plan
- WP 12-VC.04, Quality Assurance Project Plan for Hydrogen and Methane Monitoring
- WP 13-1, Washington TRU Solutions LLC Quality Assurance Program Description

REFERENCED DOCUMENTS

- Hazardous Waste Facility Permit, Waste Isolation Pilot Plant, Permit No. NM4890139088-TSDF, issued by the New Mexico Environment Department
- WP 12-VC1684, VOC Sampling Operations

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- WP 12-VC1685, Subatmospheric Grab sampling for VOCs, Hydrogen, and Methane

- WP 12-VC1686, Passive VOC Grab Sampling

EQUIPMENT LIST

- Microsoft Excel Validation Aid Spreadsheet(s)
- Microsoft Excel Air Conversion Spreadsheet(s)
- Microsoft Excel Meteorological Data Summary Spreadsheet(s)

PERFORMANCE

NOTE

EDDs must be evaluated within five calendar days of receipt.

NOTE

Validation must be completed within five calendar days of receipt of the analytical data package for data that exceeds levels in Attachment 5. For all other data, validation must occur within 14 calendar days of receipt of analytical data package. Upon receipt, the analytical data package will be stamped indicating the date of receipt.

1.0 EDD REVIEW

1.1 Print email and Excel EDD file.

1.2 Ensure steps in Sections 1.0 and 2.0 of WP 12-VC3210 have been performed for the repository samples in EDD.

1.3 Review EDD using normalized results from the VOC database to determine if regulatory limits (see Attachment 5) have been exceeded and complete Attachment 3.

1.4 Sign and date printed email along with Excel EDD file, and store in accordance with the VOC Monitoring RIDS.

1.5 **IF** regulatory limits have been exceeded,
THEN the data package must be validated within five calendar days of receipt of analytical data package.

2.0 VOC DATA VALIDATION

2.1 Validator, sign and date validation checklist.

2.2 Record Data Package number at the top of each attachment page.

2.2.1 Holding time

[A] Verify that sample was analyzed within 30 days of collection.

[B] **IF** holding time is exceeded,
THEN process in accordance with EPA Functional Guidelines.

[C] Record on checklist.

[D] Verify that the analysis dates are consistent on laboratory reports and raw data sheets.

[E] Record on checklist.

2.2.2 Instrument Performance Check

[A] Verify that bromofluorobenzene (BFB) tuning was performed at the beginning and every 24 hours thereafter during sample analysis.

[B] Verify that the BFB tuning criteria listed in EPA Method TO-15 were met.

[C] Verify that the calibration mass assignments were correct.

[D] Verify the ion abundance listing was normalized to m/z 95.

[E] Record on checklist.

[F] **IF** results are **NOT** in compliance with the criteria,
THEN process in accordance with EPA Functional Guidelines.

2.2.3 Initial Calibration

[A] Verify the following:

- A minimum of 5 data points were used for each target analyte.
- Calibration standards contained all target VOCs
- Low standard concentration was ≤ Method Reporting Limit.

- Relative standard deviations (RSDs) of the relative response factors (RRFs) meet the ≤ 30 percent criteria specified in EPA Method TO-15 (two allowable exceptions up to 40 percent RSD)

- RRFs > 0.1 for each compound

- Initial calibration (ICAL) standard analyzed verified against a secondary source.

- ICAL analysis yields recoveries of the target compounds in the range of 80-120 percent for 80 percent of the compounds and in the range of 65-135 percent for all.

[B] Recalculate the RRFs and RSDs using Validation Aid Spreadsheet.

[C] Verify the following:

- Recalculated RRFs agree with laboratory reported values.

- Recalculated percent RSDs agree with laboratory reported values.

[D] Record on checklist.

[E] **IF** criteria are not achieved,
THEN GO TO the EPA Functional Guidelines and process as directed.

Table - 1 - Bromofluorobenzene Key Ions and Ion Abundance Criteria

Mass	Ion Abundance Criteria
50	8 to 40 percent of mass 95
75	30 to 66 percent of mass 95
95	Base Peak, 100 percent Relative Abundance
96	5 to 9 percent of mass 95
173	< 2 percent of mass 174
174	50 to 120 percent of mass 95
175	4 to 9 percent of mass 174
176	93 to 101 percent of mass 174
177	5 to 9 percent of mass 176

2.2.4 Continuing Calibration

[A] Verify that the following:

- BFB tuning criteria listed in EPA Method TO-15 were met.
- Daily mid-level calibration standard analyzed prior to any samples.
- Continuing calibration relative percent difference (RPD) is ≤ 30 percent.

[B] Record on checklist.

2.2.5 Blanks

[A] Verify the following:

- At a minimum, 1 method blank was analyzed per 24 hours of analysis.
- Any detection is below method reporting limits.
- Area count responses for each internal standard within 60-140 percent of the average area count responses from the initial calibration.
- Retention times of each internal standard within 20 seconds of the average retention time from the initial calibration.

[B] Record on checklist.

2.2.6 Sample analysis

[A] Verify the following:

- Samples analyzed within 24 hours of BFB tune.
- Samples analyzed within 24 hours of initial calibration or daily calibration.
- Scan range of the gas chromatography/mass spectrometry (GC/MS) from 35 to 300 atomic mass units.

- Area count responses for each internal standard within 60-140 percent of the average area count responses from the initial calibration.

- Retention times of each internal standard within 20 seconds of the average retention time from the initial calibration. Primary or secondary ion was used to quantitate target compounds.

- For internal standards that did not meet requirements, samples were reanalyzed

- Detected target analytes within the calibration range of the instrument. (If not, were the samples diluted and reanalyzed?)

- Target compounds that were found in method blank over method reporting limit (MRL) flagged with a "B."

- Correct internal standard used to quantify each detected target analyte.

- Correct RRF from the initial calibration used to quantify each detected target analyte.

[B] **IF** any of the above does **NOT** meet criteria, **THEN GO TO** the EPA Functional Guidelines and process as directed.

[C] Verify that concentrations do not exceed regulatory limits listed in Attachment 5.

NOTE

Follow WP 12-VC1684 after the 95% action level for disposal room monitoring is exceeded for any target compound.

[D] Ensure results reported with EDD results.

[E] Record on checklist.

2.2.7 Duplicates

NOTE
The sample duplicate is performed at a minimum 10 percent frequency.

[A] Using Validation Aid Spreadsheet, calculate RPDs for laboratory control sample/laboratory control sample duplicates (LCS/LCSDs), laboratory duplicates, and field duplicates.

[B] Verify the following:

- LCS/LCSD RPD is ≤ 25.
- LCS/LCSD percent recovery is ≤ 60 to 140 percent.
- Sample/sample duplicate RPD is ≤ 25.
- Field duplicate RPD is ≤ 35.

[C] Record on checklist.

2.2.8 Tentatively Identified Compounds

[A] Verify the following:

- Retention Times (RT) within 0.06 RT units of the most recent daily calibration.
- Relative intensities of the mass spectral ions of the target compounds agree within 30% as compared to the reference mass spectrum.
- All VOCs associated with the major peaks in the GC/MS total ion chromatogram identified either on the chromatogram or on the associated quantitation report.
- A reverse library search of the reference mass spectral library performed on all peaks in the method blanks and samples.
- Presence of TICs identified in the samples.
- Blank is clear of any TIC concentration.

[B] Record on checklist

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2.2.9 Checklist Closeout

[A] Perform procedure closeout as follows:

[B] Record on check sheet if data is acceptable.

[C] **IF** data is NOT acceptable,
THEN inform contract laboratory **AND** section manager of problems or deficiencies.

[D] Verify all items on the Data Package Validation Checklist have a check or **N/A** next to them.

[E] If checklist is not complete, refer to appropriate worksheet for required information.

[F] Record on checklist any necessary notes on nonconforming items.

[G] Verify all printed worksheets are signed and dated.

[H] File validation worksheets and EDD email contents with the data package.

[I] Complete applicable portions of Attachment 1.

3.0 HYDROGEN AND METHANE DATA VALIDATION

3.1 Validator, sign and date validation checklist.

3.2 Holding time

3.2.1 Verify that sample was analyzed within 30 days of collection.

3.2.2 **IF** holding time is exceeded,
THEN process in accordance with EPA Functional Guidelines.

[A] Record on checklist.

[B] Verify that the analysis dates are consistent on laboratory reports and raw data sheets.

[C] Record on checklist.

3.3 Initial Calibration

3.3.1 Verify the following:

- A minimum of 5 data points were used for each target analyte.
- Calibration standards contained hydrogen and methane.
- Low standard concentration was ≤ MRL.
- RSDs of the RRFs are ≤ 30 percent.
- RRFs > 0.1 for each compound.

3.3.2 Recalculate the RRFs and RSDs using Validation Aid Spreadsheet.

3.3.3 Verify the following:

- Recalculated RRFs agree with laboratory reported values.
- Recalculated percent RSDs agree with laboratory reported values.

3.3.4 Record on checklist.

3.3.5 **IF** criteria are not achieved,
THEN GO TO the EPA Functional Guidelines and process as directed.

3.4 Continuing (Daily) Calibration

3.4.1 Verify that the following:

- Mid-level calibration standard analyzed prior to any samples.
- Continuing calibration RPD is ≤ 30 percent.
- Concentration of the continuing calibration (CCAL) was near the mid-point of the calibration range.
- RTs of hydrogen and methane in the CCAL are within 4.5 seconds of the average RT(s) from the initial calibration.

3.4.2 Record on checklist.

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3.5 Blanks

3.5.1 Verify the following:

- At a minimum, 1 method blank was analyzed per 24 hours of analysis.
- Any detection is below method reporting limits.

3.5.2 Record on checklist.

3.6 Sample analysis

3.6.1 Verify the following:

- Samples analyzed after the quality assurance (QA) criteria were met.
- Samples analyzed within 24 hours of initial calibration or daily calibration.
- Detected target analytes within the calibration range of the instrument. (If not, were the samples diluted and reanalyzed?)
- Target compounds that were found in method blank over MRL flagged with a "B."

3.6.2 **IF** any of the above does **NOT** meet criteria,
THEN GO TO the EPA Functional Guidelines and process as directed.

3.6.3 Verify that concentrations do not exceed regulatory limits listed in Attachment 5.

3.6.4 Ensure results reported with EDD results.

3.6.5 Record on checklist.

3.7 Duplicates

NOTE

The Sample Duplicate is performed at a minimum 10 percent frequency.

3.7.1 Using Validation Aid Spreadsheet, calculate RPDs for LCS/LCSDs, Laboratory Duplicates, and Field Duplicates.

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3.7.2 Verify the following, and record on checklist:

- LCS/LCSD RPD is ≤ 25.
- LCS/LCSD percent recovery is ≤ 70 to 130 percent.
- Sample/sample duplicate RPD is ≤ 25.
- Field duplicate RPD is ≤ 35.
- Recalculated data matched results reported in data package.

3.8 Checklist Closeout

3.8.1 Perform procedure closeout as follows:

3.8.2 Record on check sheet if data is acceptable.

3.8.3 **IF** data is NOT acceptable,
THEN inform contract laboratory **AND** section manager of problems or deficiencies.

3.8.4 Verify all items on the Data Package Validation Checklist have a check or **N/A** next to them.

3.8.5 If checklist is not complete, refer to appropriate worksheet for required information.

3.8.6 Record on checklist any necessary notes on nonconforming items.

3.8.7 Verify all printed worksheets are signed and dated.

3.8.8 File validation worksheets and EDD email contents with the data package.

3.8.9 Complete applicable portions of Attachment 2.

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4.0 ASSOCIATED DATA HANDLING

NOTE

Air flow, temperature, pressure, density, and relative humidity readings are collected at a weather station in E-300 and at the exhaust shaft each sampling day and averaged over the length of the sampling event. Density calculations are based on "Subsurface Ventilation and Environmental Engineering," Malcolm J. McPherson, pg. 512, equations numbered 14.43, 14.53, and 14.51.

4.1 Data Collection for the Normalization of Airflow

NOTE

This section does not pertain to disposal-room sampling.

4.1.1 At user's computer, perform the following:

[A] Connect SC12 connector cable to the Storage Module and to the SC532 Interface.

[B] Connect interface to an open COM port on the back of the computer.

4.1.2 Open the PC208W program as follows:

[A] Select the Storage Module option at the top of the screen.

[B] Choose the SM192/SM716 option.

[C] Verify COM port selected on the left is the same one as the cable connected to user's computer.

[D] Connect to the Storage Module using the green connect button at the bottom of the screen.

[E] Select the Data option on the top tool bar.

[F] Choose the Get New option.

[G] After the download is complete, exit PC208W and open Windows Explorer.

[H] Open the WS Data folder.

[I] Go to Open File, select PC208W, select all files, and open the new file. Text Import Wizard will appear.

[J] Choose the Delimited field in Step 1, Comma option in Step 2, and General option in Step 3.

[K] Copy and paste the new data to WS Data and save the updated WS Data Folder.

[L] Open Sample Data File (C:\Sample Data).

[M] In WS Data Folder, find the time that corresponds with the sample times and copy the year, Julian Date, time, pressure, temperature, relative humidity, airflow, and actual density for these times.

[N] Copy and paste the associated data to the Meteorological Data Summary Spreadsheet.

[O] Close the WS Data Folder.

4.1.3 Retrieve Central Monitoring System (CMS) data through email from the Alternate CMS Cognizant Engineer.

[A] Copy the file to the CMS folder and name file by date (e.g., 01 Oct 10).

[B] Open CMS data in Excel, select the month and date; this will bring up the Text Import Wizard.

[C] Choose Delimited field in Step 1, choose the space option in Step 2, and select the General option in Step 3.

[D] Select the time, airflow, temperature, relative humidity, and pressure data (do not select the date) that corresponds with the sample time (there should be approximately 25 time intervals), and copy and paste it to the Meteorological Data Summary Spreadsheet under CMS Selection.

[E] Manually input the year and date in their respective cells.

[F] Input the corresponding sample ID in the upper left-hand corner and save the file as these sample numbers inside the Normalize folder.

4.1.4 If the CMS data are unavailable, obtain the weekly ventilation report information for the time period that the samples were collected.

[A] Input average airflow in Air Conversion Spreadsheet as standard cubic feet per minute (SCFM).

[B] Record "NA" in the corresponding RH, pressure, air density, and air flow acfm slots in the Air Conversion Spreadsheet.

4.1.5 If the weather station data are unavailable, perform the following:

[A] Use airflow average from one of the following (listed in the order of preference):

- Manual readings at time of sample collection described in WP12-VC1684
- Data from Mine Weather Station (MWS) at S-400, E-300
- Subtraction of the north circuit airflow and the waste circuit airflow (from other MWS locations) from the total airflow to obtain the average airflow from the E-300 drift.

[B] Use the averages for temperature, relative humidity, and barometric pressure gathered from Exhaust Shaft MWS to replace missing values from the S-1300, E-300 MWS.

[C] Input the following in Air Conversion spreadsheet:

- Total airflow average
- Temperature
- Relative humidity
- Barometric pressure

4.1.6 Submit hard copy of the Meteorological Data Summary spreadsheet to the Team Leader or Validator for review and validation of the record.

4.1.7 Team Leader, review submitted spreadsheet for internal consistency and completeness.

4.1.8 Cognizant Individual, transfer the results to the Air Conversion Spreadsheet from the Meteorological Data Summary Spreadsheet.

4.1.9 For any results listed on the Meteorological Data Summary Spreadsheet that are listed as SCFM, record the airflow directly into the final SCFM column.

4.2 Canister Pressure Verification

4.2.1 Upon receipt of information from laboratory containing sample canister pressure measurement, use Attachment 8 to compare the field pressure/vacuum to the laboratory-reported pressure/vacuum for each sample to determine if the canister has maintained significant pressure/vacuum.

4.2.2 On Attachment 8, circle either "V" for vacuum or "P" for pressure and enter the following:

[A] Sample number

[B] Canister number

[C] Field psi/vacuum

[D] Laboratory psi/vacuum

[E] Difference

[F] Acceptance

4.2.3 For pressurized samples, if the pressure in the canister is less than 2.5 psi, void the sample.

4.2.4 For samples under vacuum, if the vacuum in the canister has lost more than 2.5 inches of mercury or is at atmospheric pressure, void the sample.

5.0 SAMPLE LINE FAILURE EVALUATION

5.1 In the event that a sample line cannot be purged prior to taking a sample, and cannot be repaired, the line should be considered failed, perform the following:

5.1.1 Perform Step 6.2.

5.1.2 If the sample line is to a bulkhead location, generate work package to replace the line prior to next scheduled sample collection.

5.1.3 If the sample line is to a closed room location, perform Step 5.2.

5.2 Determine if sample lines adjacent to the failed sample line are working.

5.3 **IF** adjacent sample location line are functioning,
THEN perform Step 5.5.

5.4 **IF** the adjacent lines are **NOT** functioning,
THEN perform Step 5.5.7.

5.5 **IF** the adjacent line(s) are functioning,
THEN perform the following:

5.5.1 Perform "Student's T" test steps (5.5.2 and 5.5.3) to determine if the previous results from the nonfunctioning lines can be statistically similar to the previous results from the adjacent line(s).

NOTE

In performing the "Student's T" test, prior concentrations from nonfunctioning sample lines and lines adjacent to the nonfunctioning line will be evaluated to determine if they are statistically similar. In performing this test the magnitude of ***t*** will be compared to the critical ***t*** value from SW 846, Table 9-2 (EPA, 1996).

5.5.2 Determine which adjacent sample lines are active.

5.5.3 Gather the concentration data from the failed line and all active adjacent lines for at least three, but no more than nine, measurement periods immediately prior to the sample line failure.

[A] For results listed as "Non Detects (ND)" a value of one half of the then current Method Detection Limit (MDL) will be assigned

[B] Perform the following for each individual adjacent sample line:

- Calculate the difference, d, between the adjacent sample line and the failed sample line for each time period.
- Calculate the average, d-bar, of all differences calculated in previous step.
- Calculate the standard error (standard deviation of calculated differences/square root of the number of calculated differences).
- Calculate "t" [d-bar/(standard error)].
- Determine Tcrit from the table below based on N, the number of calculated differences.

[C] Perform the following for the combined average of all adjacent sample line.

- Calculate the combined average of the adjacent sample line readings for each time period.
- Calculate the difference, d, between the combined adjacent sample line average and the failed sample line for each time period
- Calculate the combined average, d-bar, of all differences calculated in previous step.
- Calculate the standard error (standard deviation of calculated differences/square root of the number of calculated differences)
- Calculate "t" [d-bar/(standard error)]
- Determine Tcrit from the table below based on N, the number of calculated differences.

5.5.4 **IF** the test determines that the lines are statistically similar,
THEN no further action is required, proceed to Step 5.5.9.

5.5.5 **IF** the lines cannot be statistically compared,
THEN perform Step 5.5.6.

5.5.6 Determine if the most recent sample result from the failed line was above the first action level listed in Attachment 4.

5.5.7 **IF** the results are over the first action level,
THEN perform notifications required in Step 6.1.

5.5.8 **IF** the most recent sample result from the failed line is below the first action level,
THEN no further action is needed, proceed to Step 5.5.9.

5.5.9 Perform notification of evaluation results in Step 6.3.

6.0 NOTIFICATION PROCESS

6.1 For concentrations measured over action levels or concentrations of concern, including running annual averages, notify the following organizations. This notification shall include:

- Type of notification
- Date of occurrence
- Location of occurrence
- Description of occurrence

Immediately upon obtaining validated analytical results:

- Washington Regulatory and Environmental Services (WRES)
- WTS-Operations
- Carlsbad Field Office (CBFO)

Within seven calendar days of obtaining validated analytical results in writing and via email notification list:

- New Mexico Environmental Department (NMED)

6.2 For notifications of sample line loss, notify the following organizations. This notification shall include:

- Type of notification
- Date of occurrence
- Location of occurrence
- Description of occurrence

Immediately upon loss identification:

- WRES
- WTS-Operations
- CBFO

Within seven calendar days of loss identification, in writing, posting on Waste Isolation Pilot Plant (WIPP) web page, and via email notification list:

- NMED

6.3 For notification of sample line loss evaluation, notify the following organizations. This notification shall include:

- Type of notification
- Date of evaluation
- Results of evaluation
- Actions to be taken

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Immediately upon completion of evaluation:

- WRES
- WTS-Operations
- CBFO

Within seven calendar days of completion of evaluation in writing, posting on WIPP web page, and via email notification list:

- NMED

7.0 COMPLETENESS REPORTS

NOTE

Completeness reports are generated monthly and summarized in an annual completeness report. Completeness is based on four samples taken a week. Field quality control (QC) is included in the total, and is based on 5 percent frequency. Overall completeness criterion is 95 percent.

7.1 Monthly Sample Completeness Monitoring Report

7.1.1 VOC Monitoring Personnel, compile completeness Information from the Canister Check Out Log.

7.1.2 Record required information on sample completeness monitoring report.

7.1.3 When report is complete, sign and send to Environmental Monitoring.

7.1.4 Environmental Monitoring Personnel, review sample completeness monitoring report.

7.1.5 Approve sample completeness report.

7.1.6 Place reports in the sample completeness monthly report book with other project files.

7.2 Annual Completeness Report

7.2.1 Compile information from monthly completeness reports.

7.2.2 Environmental Monitoring personnel, review and approve annual completeness report.

7.2.3 Place reports with the sample completeness monthly report book and file with other project files.

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8.0 TIC EVALUATION

NOTE

TIC concentrations found at sample location VOC-B are not counted in TIC evaluations.

8.1 Determine which TICs, if any, have been detected in 10 percent of the samples by using EDDs and/or the VOC monitoring database. See Attachment 5 for VOC Regulatory Limits.

8.2 **IF** TICs as described in WP 12-VC.01 occur in 10% or more of the samples,
THEN fill out Attachment 11 and forward to RCRA Permitting. The TICs will be evaluated to determine if they will be excluded from the target list compound.

8.3 **IF** the TICs are NOT excluded and the TIC maintains the 10 percent or more for the reporting year,
THEN the TIC will be added to the target compound list for the following year by the VOC team leader.

Attachment 1 - Data Validation Checklist

Data Package #_____

HOLDING TIMES	YES	NO
Were the samples analyzed within the 30-day holding time?		
Were the analysis dates consistent on the laboratory reports and raw data sheets?		

GC/MS INSTRUMENT PERFORMANCE CHECK	YES	NO
Was a BFB tuning compound analysis performed at the beginning and every 24 hours during sample analysis?		
Did the instrument meet the BFB tuning criteria listed in Method TO-15?		
Were the calibration mass assignments correct?		
Was the ion abundance listing normalized to m/z 95?		

INITIAL CALIBRATION	YES	NO
Were a minimum of five calibration standards at different concentrations analyzed?		
Did the calibration standards contain all of the VOC target compounds?		
Was the concentration of the low standard at a concentration $\leq$ MRL?		
Did the calculated percent RSDs of the average RRF meet the <30 percent criteria specified in Method TO-15 (with two allowable exceptions up to 40 percent RSD)?		
Were the RRFs >0.1 for each target VOC compound?		
Was an ICAL standard analyzed that was verified against a second source standard?		
Did the ICAL analysis yield recoveries of the target compounds in the range of 80 -120 percent for 80 percent of the compounds and within 65-135 percent for all compounds?		
Did recalculated average RRFs agree with the lab reported values (recalculate at least one target VOC RRF per internal standard)?		
Did recalculated percent RSDs agree with lab reported values (recalculate at least one target VOC RSD per internal standard)?		

Attachment 1 - Data Validation Checklist

Data Package #_____

DAILY CALIBRATION	YES	NO
Did the BFB performance check standard meet the acceptance criteria?		
Was a mid-level daily calibration standard analyzed daily prior to any samples?		
Did the RRF of each target compound in the daily standard meet the precision criteria of <30 percent difference (%D) from the average RRF from the initial calibration?		

BLANKS	YES	NO
Was a method blank analyzed prior to samples and at least once during each 24-hour analysis period?		
Were the area count responses for each internal standard within 60-140 percent of the average area count responses from the initial calibration?		
Were the retention times of each internal standard within 20 seconds of the average retention time from the initial calibration?		
Were the concentrations of any detected target VOC compounds less than the MRL?		

SAMPLE ANALYSIS	YES	NO
Were the samples analyzed within 24 hours of meeting the BFB tuning criteria?		
Were the samples analyzed within 24 hours of the most recent initial calibration or successful daily calibration?		
Was the scan range of the GC/MS from 35 to 300 atomic mass units?		
Were the area count responses for each internal standard within 60-140 percent of the average area count responses from the initial calibration?		
Were the retention times of each internal standard within 20 seconds of the average retention time from the initial calibration?		
If the internal standard requirements were not met, were the samples reanalyzed?		
Were detected target analytes within the calibration range of the instrument? (If not, were the samples diluted and reanalyzed?)		
Are any target compounds that were detected in the method blank flagged with a "B"?		
Was the correct internal standard used to quantify each detected target analyte?		

Attachment 1 - Data Validation Checklist

Data Package #_____

Was the correct average RRF from the initial calibration used to quantify each detected target analyte?		
Are the Concentrations below the regulatory limits?		
Do the EDD results match the reported results in the data package?		

DUPLICATE SAMPLE ANALYSES	YES	NO
Was one of the canister samples from the sample batch analyzed in duplicate?		
Did the duplicate analysis results meet the precision objective of <25 RPD?		
Did the sample batch include analysis of a field duplicate?		
Did the duplicate canister analysis results meet the precision objective of <35 RPD for any target VOC detected in the samples?		

LABORATORY CONTROL SAMPLES	YES	NO
Were a LCS and a LCSD prepared in the laboratory and analyzed with each batch of canister samples?		
Were the LCS/LCSD samples spiked with all the VOC target analytes?		
Did the LCS/LCSD recoveries meet the accuracy objective of 60-140 percent recovery?		

TARGET COMPOUND IDENTIFICATION	YES	NO
Did the retention times of target compounds in the samples match the retention times in the most recent daily standard (within 0.06 relative retention time units)?		
Did the relative intensities of the characteristic mass spectral ions of the target compounds detected in the samples agree with the relative intensities of these ions in a reference mass spectrum (within 30 percent)?		
Were all the VOCs associated with the major peaks in the GC/MS total ion chromatogram identified either on the chromatogram or on the associated quantitation report?		

TENTATIVELY IDENTIFIED COMPOUNDS	YES	NO
Was a reverse library search of the reference mass spectral library performed on all peaks in the method blanks and samples?		
Were any TICs identified in the samples?		
If any TICs were detected in the samples, can contamination from MBs be excluded?		

Attachment 1 - Data Validation Checklist

Data Package #_____

DATA PACKAGE COMPLETENESS	YES	NO
Are all signatures complete?		
Are the data valid/usable for the intended purpose		
Explain any difficulties/qualifications associated with the VOC data:		

Printed Name Signature Date

Attachment 2 - Hydrogen and Methane Data Validation Checklist

Data Package #_____

HOLDING TIMES	YES	NO
Were the samples analyzed within the 30-day holding time?		
Were the analysis dates consistent on the laboratory reports and raw data sheets?		

INITIAL CALIBRATION	YES	NO
Were a minimum of five (5) calibration standards at different concentrations analyzed?		
Was the concentration of the low standard at a concentration ≤ MRL?		
Did the calculated percent RSDs of the average RRF meet the <30 percent RSD criteria specified in the analysis procedure?		
Did recalculated average RRFs agree with the lab reported values?		
Did recalculated percent RSDs agree with lab reported values?		

DAILY CALIBRATION	YES	NO
Was a CCAL analyzed during each 24 hours of sample analysis?		
Was the concentration of CCAL near the midpoint of the calibration range?		
Were the retention times of hydrogen and methane in the CCAL within 4.5 seconds of the average retention times from the initial calibration?		
Did the RRFs of hydrogen and methane in the CCAL meet the precision criteria of <30 percent difference (%D) from the average RRF from the most recent calibration?		

BLANKS	YES	NO
Was a method blank analyzed prior to samples at least once during each 24-hour analysis period?		
Were the concentrations of any detected hydrogen or methane less than the MDL?		

Attachment 2 - Hydrogen and Methane Data Validation Checklist

Data Package #_____

SAMPLE ANALYSIS	YES	NO
Were all QA criteria met prior to analysis of canister samples?		
Were the retention times of any detected hydrogen or methane within 4.5 seconds of the average retention time from the most recent calibration?		
Were the responses of any detected hydrogen or methane within the calibration range of the instrument? (If not, were the samples diluted and re-analyzed?)		
Were the samples analyzed within 24 hours of Initial calibration or continuing calibration?		
Were any target compounds found above the MRL in the method blank flagged with a "B"?		
Are the concentrations below the regulatory limits?		
Do the EDD results match the reported results in the data package?		

DUPLICATE SAMPLE ANALYSES	YES	NO
Was one of the samples from each batch analyzed in duplicate?		
Did the laboratory duplicate analyses meet the precision objective of <25 RPD for any detected hydrogen or methane?		
Was the field duplicate within 35 RPD of the corresponding sample?		

LABORATORY CONTROL SAMPLES	YES	NO
Were the retention times of hydrogen and methane within 4.5 seconds of the average retention time from the most recent calibration?		
Did the LCS/LCSD recoveries meet the accuracy objective of 70-130 percent recovery for both hydrogen and methane?		
Did the LCS/LCSD analyses meet the precision objective of <25 RPD for hydrogen and methane?		
Do recalculated percent recoveries agree with laboratory reported values?		

Attachment 2 - Hydrogen and Methane Data Validation Checklist

Data Package #_____

DATA PACKAGE COMPLETENESS	YES	NO
Are all signatures complete?		
Are the data valid/usable for the intended purpose		

Explain any data difficulties/qualifications:

Printed Name Signature Date

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Attachment 3 - Electronic Data Deliverables

Work Package #	Date of EDD Receipt	EDD Review Due Date	Date of EDD Review	Regulatory Limits Exceeded (Y/N)	Validation Due	Validation Date	Initials

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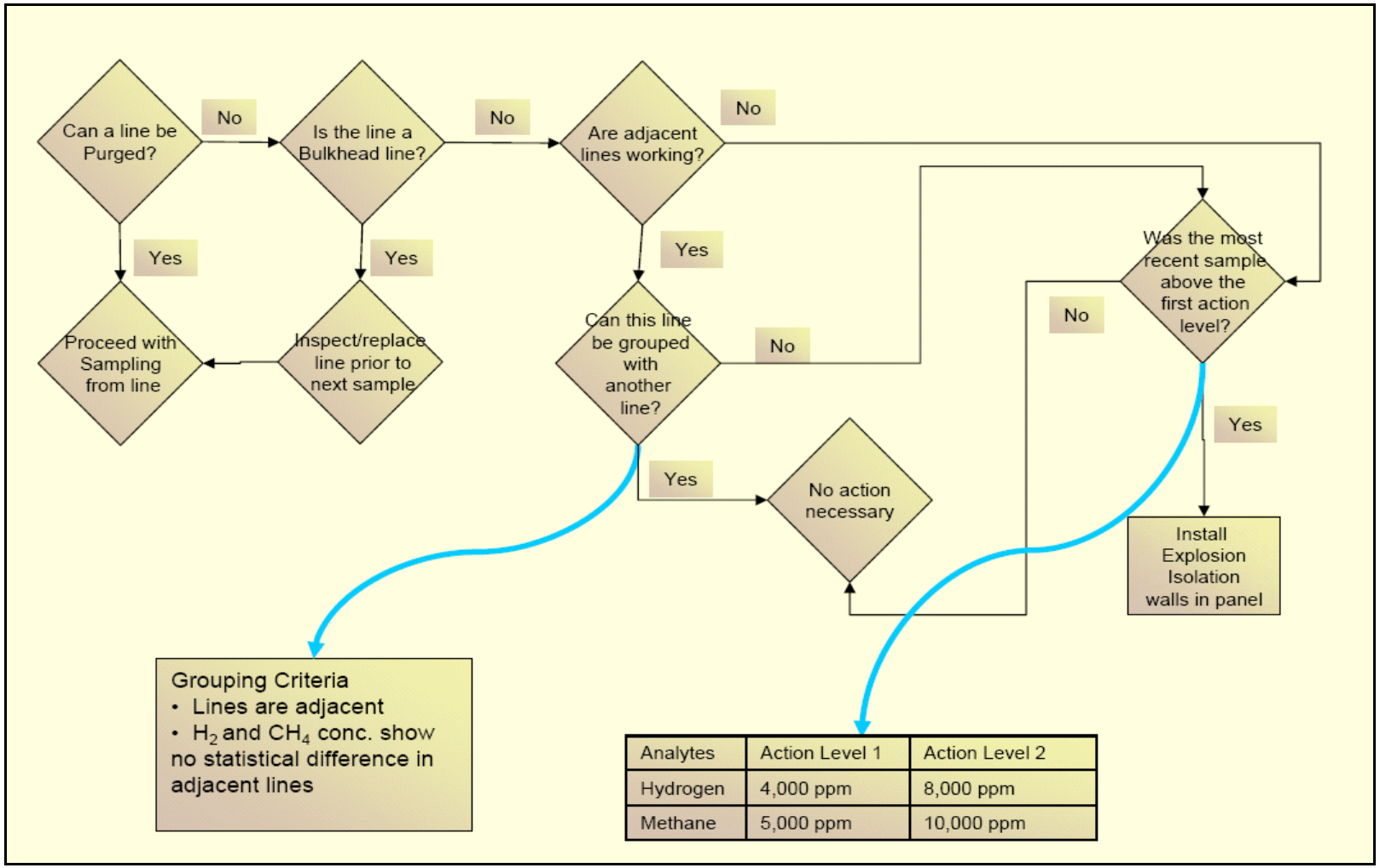
Attachment 4 - Logic Diagram for Evaluating Sample Line Loss



Analytes	Action Level 1	Action Level 2
Hydrogen	4,000 ppm	8,000 ppm
Methane	5,000 ppm	10,000 ppm

Attachment 5 - Regulatory Limits

HWFP REPOSITORY CONCENTRATIONS OF CONCERN (COC)

	COCs (ppbv*)
Carbon Tetrachloride	960
Chlorobenzene	220
Chloroform	180
1,1-Dichloroethene	100
1,2-Dichloroethane	45
Methylene Chloride	1,930
1,1,2,2-Tetrachloroethane	50
Toluene	190
1,1,1-Trichloroethane	590

*ppbv = parts per billion by volume

ACTION LEVELS FOR DISPOSAL ROOM MONITORING

Compound	50% Action Level for VOC Constituents of Concern in Any Closed Room, ppmv	95% Action Level for VOC Constituents of Concern in Active Open or Immediately Adjacent Closed Room, ppmv
Carbon Tetrachloride	4,813	9,145
Chorobenzene	6,500	12,350
Chloroform	4,965	9,433
1,1-Dichloroethene	2,745	5,215
1,2-Dichloroethane	1,200	2,280
Methlylene Chloride	50,000	95,000
1,1,2,2-Tetrachloroethane	1,480	2,812
Toluene	5,500	10,450
1,1,1-Trichloroethane	16,850	32,015

HWFP HYDROGEN AND METHANE ACTION LEVELS

Analyte	**Action Level 1**	**Action Level 2**
Hydrogen	4,000 ppmv*	8,000 ppmv
Methane	5,000 ppmv	10,000 ppmv

*ppmv = parts per million by volume

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Attachment 6 - Example Meteorological Data Summary Spreadsheet

SAMPLE #s														
DATA FROM CMS AT EXHAUST SHAFT							DATA FROM WEATHER STATION AT S1300 E300							
			Air Flow	Pressure	Temp in	Rel Hum		Julian		Pressure	Temp in	Relative	Air Flow	Actual
Year	Date	Time	In Acfm (K)	In Hg	Degrees F	%	Year	Date	Time	In Hg	Degrees F	Humidity %	In Acfm (K)	Density
0	0-Jan						0							
0	0-Jan						0							
0	0-Jan						0							
0	0-Jan						0							
0	0-Jan						0							
0	0-Jan						0							
0	0-Jan						0							
0	0-Jan						0							
0	0-Jan						0							
0	0-Jan						0							
0	0-Jan						0							
0	0-Jan						0							
0	0-Jan						0							
Sample Average			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Sample Average			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
			Air Flow	Pressure	Temp in	Rel Hum				Pressure	Temp in	Relative	Air Flow	Actual
			in acfm (k)	in Hg	Degrees F	%				in Hg	Degrees F	Humidity %	in acfm (k)	Density

EXAMPLE

Data Collector:_____ **Data Reviewer:**_____

Signature:_____ Signature:_____

Date:_____ Date: _____

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Attachment 7 - Example Air Conversion Spreadsheet

Date	Location	Sample Set (A, B)	Temp. (°F)	Relative Humidity %	Pressure (in. Hg)	Air Density (lb/ft^3)	Air Flow (acfm)	Air Flow (scfm)	Initials
	Total Flow								
	E-300								
	Total Flow								
	E-300								
	Total Flow								
	E-300								
	Total Flow								
	E-300								
	Total Flow								
	E-300								
	Total Flow								
	E-300								
	Total Flow								
	E-300								
	Total Flow								
	E-300								
	Total Flow								
	E-300								
	Total Flow								
	E-300								

E-300 Formula used: Actual Cubic Feet per Minute (ACFM)/SCFM = [Standard Density at sea level (0.075 lb/ft^3)]/[Actual density (data logger)]
Total flow formula used: ACFM/SCFM = [Standard Density at sea level (0.075 lb/ft^3)]/[Actual density (CMS)]

EXAMPLE

Attachment 8 - Pressure Comparison Between Field and Lab Receipt

Sample #	Canister #	Field psi V or P	Lab psi V or P	Difference	Acceptable for Use

(V) Vacuum - Subatmospheric Grab Sampling
(P) Pressure - Pressurized Sampling

Form Completeness and Validation:

_____ / _____ / _____

Printed Name Signature Date

Attachment 9 - Data Qualifier Definition

Data Qualifier Definition
Following is a list of data qualifiers as defined by the U.S. Environmental Protection Agency. U - Indicates compound was analyzed for but not detected. The associated numerical value is the sample quantitation limit. J - Indicates an estimated value. N - Indicates presumptive evidence of the presence of a compound. B - This flag is used by the laboratory when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound. R - The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification. NJ - Presumptive evidence of the presence of the material at an estimated quantity. UJ - The material was analyzed for, but not detected. The sample quantitation limit is an estimated quantity.

Attachment 10 - Alternate Total Ventilation Average Worksheet

Sample Date/Time Collection Period:

Ventilation Mode	**Ventilation Mode Value in KSCFM**	**Hours in Mode (in 0.25 increments)**	**Total Airflow for Sampling Period**
Normal	425		
Alternate	260		
Maintenance Bypass	TBD based on fan configuration		
Reduced	120		
Minimum	60		
Filtration	60		
Total			
Average Total Airflow for Sampling Period			

Notes:

VOC Monitoring Personnel:

Print Name Signature Date

Verified by:

Print Name Signature Date

Attachment 11 - Notification of TIC Concentrations Found in 10% of Samples Collected

Notification of TIC Concentrations Found in 10% of Samples Collected			
TIC	**CAS #**	**% of Samples Found**	**Time Period Found mm/dd/yyyy to mm/dd/yyyy**

VOC Monitoring Personnel:

Print Name Signature Date

To be completed by SEC:

Can TIC be excluded: Yes ____ No _____

If YES, explain below:

Recommended disposition of TIC:

RCRA Compliance Personnel:

Print Name Signature Date