Alberta Government

Air Monitoring Directive – Summary of Feedback and Responses for Chapter 6 (Ambient Data Quality)

The following feedback was received following the 60-day public review of the Draft Air Monitoring Directive Chapter 6 which took place in February and March 2014.

Chapter 6 - Ambient Data Quality

	Comment	Reply	Action Taken
1	General comment in noting that Airsheds are now included in definition for person responsible which would appear to put new requirements on them. Person responsible definition now includes Alberta Airshed. Subtle change in definition has large implications. See below in several clauses.	Airsheds are currently responsible for ambient data quality and for the work their contractors do on their behalf. This does not change. The airshed is ultimately responsible for the monitoring and data at the monitoring stations in their airshed.	No change made.
2	Figure 1: Should "website posting" not be "raw data posting" instead?	Agree.	Changed "web site posting" to "raw, real-time data posting online" in Table 1.
3	2.1 Project Documents - Person responsible will include Airsheds. Should be adequate to state that Airsheds can ensure that they are in QAPs for data validation. That would refer to the contractors QAP then.	As stated in response to comments on Chapter 5 (Quality System), the person responsible's QAP can refer to a contractor's work and a contractor's QAP. The airshed is ultimately responsible for the monitoring, reporting and data from the airshed's monitoring stations.	No change made.
4	2.2 Field records - Bullets are overkill unless a proviso is added. No need to record the name, equipment ID, serial number, etc. in each station log entry. i.e., why record that if you were just there for a routine check or cylinder change out? Should note that this info is needed where applicable when the log entry applies to a specific piece of equipment (s).	The mentioned bullets are guidance (not part of the clause), describing what types of things could be added to a logbook.	Changed text to read "The following are types of information that may be recorded in a station log entry".
5	DQ2-A - Person responsible will include Airsheds. Should be adequate to state that Airsheds can either maintain them or ensure that they are maintained by a contractor and the Airshed has full access to them.	As per Chapter 5, airshed is responsible for ensuring that a contractor follows the AMD.	No change made.
6	3.1 Data collection - Suggest wording change: Digital data acquisition can provide more instrument diagnostic information..... It may not necessarily.	Agree.	Changed wording in 3.1 to include "can provide".
7	DQ3-A b - Suggest wording change: Scan rates at least as fast as instrument response times for continuous gas, intermittent and particulate samplers Note: Some intermittent samplers can be connected to logging systems also.	Agree.	Change made to DQ 3-A wording as suggested.
8	DQ3-C - Include a definition of "scanned data".	Agree.	Changed DQ 3-C to read: Guidance added to section 3.1.2.

9	4.1.1 - Usually not a good idea to refer to a website even in general terms in a document of this nature.	All chapters of the revised AMD refer to the AMD website (without giving an actual URL). The website is where all cursory documents, references, forms and templates will be kept for the AMD.	No change made.
10	DQ 4-D - What is this in reference to? Temporary testing? Why would there be testing for 3 months or less?	This is for industrial ambient monitoring, required by an approval to monitor for short periods (e.g., 3 months each year).	No change made.
11	DQ4-A, B, E, F - Airshed is now the person responsible. Requirement to document data codes in a QAP or SOP. Should be adequate to state that Airsheds can either have them or ensure that the contractor have them and airshed has full access to them	Airshed is person responsible for these requirements being met, whether the airshed does or they contract the work out.	No change made.
12	DQ4-H - Data may not be invalid if it is deemed the cal check system itself is in error. Need to include right in the clause - that the option as noted in subsequent paragraph exists.	This will be covered in the Calibration Chapter (Chapter 7). This is discussed in the guidance and inherent in the clause (if data is deemed as valid, i.e., if calibration equipment is not working correctly, then data does not need to be invalidated). If the calibration equipment is not working, would need to question if past calibrations were valid (and subsequently is data valid if past calibration certainty is unknown).	Clause DQ 4-H was removed as it is covered in the Calibration Chapter (Chapter 7).
13	DQ4-P - Airshed is now the person responsible. Requirement to document data codes in a QAP or SOP. Should be adequate to state that Airsheds can either have them or ensure that the contractor has them and airshed has full access to them.	Airshed is person responsible – responsible for these requirements being met – whether airshed does or they contract the work out.	No change made.
14	4.3.4 - Should relative humidity measurements > 100%, wind direction > 360 deg etc. be noted here?	Agree.	Added relative humidity and wind direction example to guidance in section 4.3.4.
15	Very straight forward and nothing stood out to be anomalous or questionable. Did notice one minor grammatical error on Chapter 6 pg. 23. In Table 1, PM_C is written as PMC.		PMC changed to PM_c in Table 1.

16	4.3.6 (p.13) (Derived Parameter Relationships) does not address this case, which has been observed in the real world: Analyzer measures NO/NOx, calculates NO2. Datalogger captures each parameter on separate channel, fails to capture enough data from one channel (NOx, for example) to calculate an hour average due to failing hardware in the logger. Nature of the failure is communication with the analyzer, no effect on accuracy of logged values. NO and NO2 data are valid for the hour, NOx is invalid due to insufficient data to calculate. Current CASA requirements (and this section, it appears) do not allow this hour to be uploaded for NO and NO2, as the balance is not preserved though normal operation of the instrument has occurred.	DQ 4-L states: "For continuous parameters not directly measured by sensors or analyzers, the person responsible shall preserve relationships between the measured and derived parameters during validation." In the case of NO/NO_2/NO_X, any adjustments applied to NO (e.g., baseline or zero adjustments) need to be applied equally to NO_X. This clause requires that if any adjustments are made to one parameter, they must be made to all to keep the relationship preserved. It does not require that if data is incomplete for one channel, that one is unable to upload any data for that hour. This clause relates to data validation, not reporting.	No change made.
17	Section 4.1.3 – Data Completeness: Some consideration should be given to analyzers that have a manufacturer specified burn-in or stabilization period; Ethylene is a good example. Is that period during which the analyzer is not collecting valid data considered calibration and disregarded from uptime?	Regular monthly calibrations are not included in data completeness. Extra calibrations associated with operational issues are generally excluded from data but more over are also considered downtime. Burn-in periods should only be due to repairs or new installation and as such it is always downtime and flagged as such. Burn-ins or instrument stabilizations are not collecting valid data and are flagged down until a new calibration is completed to validate data going forward.	Guidance modified to state: When calculating data completeness, data collected during QA/QC activities and any zeros, spans, calibrations, audit checks, or equipment start-up/stabilization are not included.
18	As per comment 36 on Chapter 5, suggest that this section include a statement that the section only applies to ambient air monitoring required by an EPEA Approval, Code of Practice, Registration or other legal requirement. No further comments on section 6, the recommendations provide clarity and improvements for ambient data reporting.	DQ **Error! No text of specified style in document.**-A states "The person responsible must be in compliance with the requirements set out in the Data Quality Chapter of the AMD on or before XXX for all continuous ambient air monitoring." The definition for person responsible includes "the holder of an approval or other authorization under the Environmental Protection and Enhancement Act".	No change made.

19	DQ 1-B through DQ 1-D: Is it really necessary to clutter up the revised AMD with repealed sections? It is just clutter. It does not add value to the document. Just issue a new and revised AMD with a note in the introduction that this edition replaces all previous editions and versions published prior to 2015.	The entire AMD 1986 has not yet been replaced. The 1989 AMD will still be active until the last revised chapter is released. Each chapter that is released will state which section of the 1989 AMD it replaces. This also pinpoints where to look for requirements that were carried over from the old AMD and what each chapter covers. When the revisions are all complete. we may state in the Introduction that all previous versions of the AMD have been repealed.	No change made. Will consider this suggestion when AMD revisions are complete.
20	DQ 3-A: Data scans more frequently than 1-minute are unnecessary. How would ambient data collected at frequencies greater than 1-minute add value to the data monitoring and collection system?	Clause DQ 3-A pertains to scan rates (interval that datalogger pulls values from instruments), not to reported values. This clause requires that dataloggers be set to scan at 1-second intervals for meteorological parameters. This should not be an issue for all current meteorological sensors.	No change made.
21	DQ 4-A: If the purpose of item DQ 4-A is to establish a reporting system similar to the on-line CEM reporting system, we will have to object strongly. The CEM on-line reporting system has been an unmitigated disaster. It is cumbersome, it has been costly both in money and time, and has never delivered on its promise to streamline data reporting. In establishing any new data reporting system, the AMD needs to consider a reporting system similar to the Specified Gas Emitters Report format. It is EXCEL-based, easy to understand and submit.	Clause DQ 4-A does not establish a reporting system. It requires that ambient data be flagged with validation codes (done automatically through the datalogger and manually when necessary to pinpoint anomalous data or events). This is not unlike current requirements to flag data that is irregular. All data providers reporting ambient data will be required to report electronically to the province's Data Warehouse once the revised Reporting Chapter of the AMD is complete. This clause on validation codes will ensure that all data are flagged the same way, using consistent data validation codes, so that reasons for invalid data are understood and data is comparable.	Changed clause 4-A so that only missing or anomalous data need a validation code applied. Valid, regular, data will have no validation code associated. (This is current practice for reporting ambient data to the CASA Data Warehouse.)
22	DQ 4-Q: The requirement that the Level 3 Validation be by an individual independent of field operations and primary data validation is unreasonable for small-sized operations that collect a limited amount of data with a small staff where individuals who generally function in a Level 3 capacity are also called upon from time to time to perform primary data validation.	DQ 4-Q requires that one employee who is outside of the field operations goes through monthly ambient data to look for and inquire about any discrepancies found. No matter the size of the operation, data needs to be scrutinized and signed off on by an individual identified by the company. If independent contractors are monitoring and reporting for a company, the company is still responsible for data submission after proper review.	No change made.

23	DQ 4-S: Consideration needs to be given by ESRD to less frequent reporting. Either the reporting frequency be reduced to once a quarter with perhaps an annual review, or monthly reporting with no annual report. In this day and age when data is transferred electronically, and not in hard copies, there is no reason with modern-day computer processing power that ESRD could not perform the annual validation in its own shop. The reporting requirements imposed by ESRD on the regulated community are already excessive, burdensome and costly, there needs to be a good-faith effort on the part of ESRD to reduce this burden.	Reporting requirements will be provided in Chapter 9 of the revised AMD – Reporting Chapter. The frequency that approval holders are required to report remains. Monthly and annual reports each serve specific purposes in reviewing ambient conditions, providing interpretation, and notifying the Department/Regulator. The Department/ Regulator is unable to validate or verify data from a facility. This is the responsibility of the operator.	No change made.
24	Section 3.2, DQ 3-H: The person responsible shall archive raw ambient data that is collected separate and distinct from the validated data. Suggest: Clarify what is implied by "separate and distinct". Is the intention that the storage **media** must be distinct or that the raw values must be retained in addition to the validated data.	For clause DQ 3-H, raw data and validated data must be archived separately so that validated data could be compared to raw data to see what changes, if any, have been made to the raw data. How the person responsible chooses to do this is up to them.	No change made.
25	Section 4.0: Suggest alignment between the terminology in Section 4.0 and that in Figure 1.	Agree.	Changed headings in Table 1 to match those in section 4.0 for Level 0, Level 1, etc.
26	Section 4.1.1: Reference to AMD website for data validity codes. Suggest revision/timestamp be included within the AMD Toolbox files on the AMD website.	Agree.	Will update the list of data validation codes with a document timestamp, and update on CASA website: • casadata.org
27	Section 4.4: Comment that: PM10 particles are inclusive of PM2.5, so PM2.5 concentrations should not be greater than PM10 for collocated analyzers. Suggest: Add to Table 1	This is stated in Table 1, by requiring that $PM_{2.5} + PM_c = PM_{10}$. If this relationship is preserved, $PM_{2.5}$ cannot be greater than PM_{10}.	No change made.
28	The main theme that was noted during our review of Chapter 6 was that is requires that many facilities will need to change equipment and/or processes. A one-year proposed compliance period may be too short of a period to implement changes.	Requirements of Chapter 6 should not require that facilities change any equipment, but rather update data validation and verification processes.	In response to this comment and comment 41, the one-year proposed compliance period was changed to two years.
29	Section1.0 Purpose: In regards to the "Web site posting" in the Data Collection portion of Figure 1 Data collection and Management Process Flow Chart, please clarify if this refers to electronic reporting or the real-time reporting that is mentioned on page 10, paragraph 2.	Refers to real-time, raw data posting online – for those data providers that transmit real-time data (airsheds). All other data reporting would be included in the final step in Table 1.	Changed "web site posting" to "raw, real-time data posting online" in Table 1.
30	Section 2.0 Documents and Records: This section states that "All documents and records should be easily accessible. The majority of documents and records referred to in this section should be in electronic formation to ensure accessibility and long-term storage." Please provide options and clarity to deal with remote sites and having all documents/record easily accessible. Records retention is typically done at the facility not at the remote site.	Documents that are needed by personnel maintaining a monitoring station should be accessible to them – whether that means a printed copy of an SOP is at the station, or they have electronic access via the site computer, a laptop, or remote access.	No change made.

		Chapter 5 (Quality System Chapter) requires that documents be "accessible at known locations" and "Current editions of applicable controlled documents shall be available at all locations where operations essential to the functioning of the air monitoring and reporting activities are performed" (QS 3-A and 3-D).	
31	DQ 3-A states "When analog data collection systems are used for ambient air monitoring, the person responsible shall implement: (a) 1-second scan rates for all meteorological parameters …" The 1-second scan rates cannot be met at all sites. Consider a larger second scan rate or longer implementation time period for this Chapter to allow for equipment upgrades if needed. The 1-second scan data retention requirement of 10- years is also a large amount of data to retain. Please consider a shorter retention time requirement.	Clause DQ 3-A pertains to scan rates (interval that datalogger pulls values from instruments), not to reported values. This clause requires that dataloggers be set to scan at 1-second intervals for meteorological parameters. This should not be an issue for all current meteorological sensors. This does not impact data retention as data must be retained as 1-hour averages or 1-minute base averages for QA/QC data (zero/span, multipoint checks) only. See section 3.1.2 Data Averaging Intervals.	Edited clauses DQ 3-C and 3-D to clarify that final averages of 1-hour or less must be retained.
32	DQ 3-H states that "the person responsible shall archive raw data that is collected separate and distinct from the validated data." Please provide feedback or clarification on the use of "exception reporting" in terms of the requirement to keep 1-second scan rate raw data.	For clause DQ 3-H, raw data and validated data must be archived separately so that validated data could be compared to raw data to see what changes, if any, have been made to the raw data. How the person responsible chooses to do this is up to them. As per clause DQ 3-A, 1-second scan rates must be used for dataloggers scanning meteorological sensors, and does not pertain to reporting or retaining 1-second data.	No change made.
33	DQ 4-E states that "if any recorded ambient data are suspect, the person responsible shall: (e) verify the effectiveness of corrective action taken to resolve the root cause." We request some clarity on how to verify the effectiveness of each corrective action. The process of determining the effectiveness of corrective actions can be difficult. Please clarify what expectations and rigor this process should have.	What is intended in DQ 4-E is that not only is corrective action taken when data is found to be invalid, or an issue arises, but that the person responsible confirms that the corrective action has resolved the issue – i.e., the data is now valid, the monitor is working properly, no further action is needed. If corrective action is effective then the issue is no longer detectable.	No change made.
34	Last paragraph, section 4.2 states that "Organizations conducting air monitoring activities are increasingly making data available to the public in near real-time on websites… In some cases. Public feedback may actually assist in data screening by alerting data providers to possible issues." Please clarify if industry data will be reported in real-time. This is not currently possible at some remote sites.	Data from industrial operations will not be reported in real time. Only QA/QC'd ambient data reported will be posted to the online Data Warehouse for industry stations (will be a requirement in the Reporting Chapter – Chapter 9).	No change made.

35	DQ 4-G states that "the person responsible shall use the operational acceptance limits specified by (a) the Monitoring Requirements and Equipment Technical Specifications (Chapter 4) of the AMD, or (b) the manufacturer, in the absence of an applicable AMD specification." It is difficult to assess this clause when Chapter 4 has not yet been released for comment. Consider allowing more time for comment on this Chapter after Chapter 4 has been released.	Chapter 4 will be available for review later. This requirement appears in Chapter 4.	Removed this clause as it is covered in Chapter 4. Changed to guidance.
36	DQ 4-H states that "when zero, span or one-point calibration checks exceed operational acceptance limits, as defined in the AMD, the person responsible shall invalidate ambient measurements back to the most recent point in time where such measurements are known to be valid." Please provide some clarity of what the most recent point in time would be where measurements are known to be valid. Does this mean that all data will be invalid since the last zero, span or one-point calibration?	Data would be invalidated back to the last known acceptable zero/span or calibration; or to the point where the data is known to have been affected (e.g., in the case of a power failure).	No change made..
37	DQ 4-I speaks to Chapter 4 of the Air Monitoring Directive. It is difficult to assess this clause when Chapter 4 has not yet been released for comment. Consider allowing more time for comment on this Chapter after Chapter 4 has been released.	This requirement appears in Chapter 4.	Removed this clause as it is covered in Chapter 4. Changed to guidance.
38	DQ 4-M states that "the person responsible shall adjust the hourly averages of valid negative gas and particulate concentrations to zero prior to *for* reporting this data." - typo error "to for" Adjusting the negative values to zero has not been a requirement of the AMD in the past. Facilities will need to add this step to their procedures and is likely to cause more work when a negative value can be assumed as zero. Consider allowing facilities to leave negative concentrations as they are.	The AMD requires zero adjustment. Data logging systems can and should be correcting for zero drift on a daily basis. This clause requires that final hourly averages that are negative be adjusted to zero for reporting purposes. Negative gas and PM concentrations affect averaging and analysis of data, artificially reducing monthly or annual averages, since negative gas and PM concentrations are not possible but rather result from analyzer drift.	Typo corrected. Modified clause 4-M to refer to Table 2 which outlines when to change negative values for PM and gas parameters.
39	DQ 4-O states that "the person responsible shall (a) identify and (b) investigate all anomalous data and outliers collected using validated data reduced to hourly averages." Investigating all anomalous data and outliers is difficult because of the remoteness of the monitoring trailers. Internal system errors can be identified and investigated. However isolated events are impossible to investigate. - Consider rewording to "(b) investigate, where practicable, all anomalous data and outliers collected using validated data reduced to hourly averages."	DQ 4-O requires that any suspect data (anomalies or outliers) be pinpointed and checked to determine if the data are valid or not. If this is not done, invalid data could be reported to and used by the Department/Regulator. All data points must be valid, requiring an investigation of anomalous data and outliers for continuous ambient data.	No change made.

40	Section 4.5 explicitly states that there must be an independent assessment of the validated data and has requirements to obtain and report certification statements as well. This section is an increase in the level of administration at the site level. An independent assessment is both timely and has costs associated with it. The process is rigor given the three other verification/validation levels and the independent assessment process is not necessary. Please consider removing the Level 3 – Independent Assessment.	DQ 4-Q requires that one employee who is outside of the field operations goes through monthly ambient data to look for and inquire about any discrepancies found. If independent contractors are performing the monitoring and reporting for a company, the company is still responsible for data submission after proper review.	No change made
41	DQ 1-A "Will be ~1 year after the chapter comes into effect" - One year is an aggressive deadline. Husky suggests a three (3) year phase in period to allow operators with the required time to implement this improvement and build appropriate processes, mechanisms and/or systems as required.	Requirements in Chapter 6 include changes to data validation and verification techniques. It is recognized that changes to SOPs and familiarizing personnel will be required. Two years phase in is adequate for this to occur.	In response to this comment and comment 28, the one-year proposed compliance period was changed to two years for compliance once Chapter 6 is released.
42	Page 2: "Aggregate data into 1-hour averages" - What is the recommended aggregation method?	This step "aggregate data into 1-hour averages" in Figure 1 applies to those data providers who collect sub-hourly data from dataloggers (e.g., 5-minute data). This is not done at all monitoring stations. If sub-hourly data is collected it needs to be averaged into a 1-hour average (either done automatically in the datalogger, or after download to data provider's server). It would be a straight average (e.g., add the 12 5-min data points and divide by 12 to get the 1-hour average).	No change made.
43	"DQ 3-A (a) 1-second scan rates for all meteorological parameter" - This may require new equipment / retrofit or reprogramming of existing equipment.	Clause DQ 3-A pertains to scan rates (interval that datalogger pulls values from instruments), not to reported values. This clause requires that dataloggers be set to scan at 1-second intervals for meteorological parameters. This should not be an issue for all current meteorological sensors.	No change made.
44	Section 4.4: "NO reacts quickly with O3, which can result in low daytime O3 in urban areas, and higher O3 downwind of urban areas" – Please provide reference for this. Photochemical reactions are complex, and depend on solar radiation/UV, ambient O3 and NO/NO2 concentrations and VOCs/NOx ratios. Therefore, the stated correlation may be effective in very limited conditions.	The bulleted list in section 4.4 is guidance and gives examples of relationships between parameters to suggest what to look for when reviewing graphical data. It states "The above list is not comprehensive, and data contradictory to any of these examples may not be invalid, but may warrant additional investigation." Using and reviewing plotted/graphical data is not a requirement.	Removed "reacts quickly" from the statement in section 4.4.

| 45 | Definition: "baseline concentration" means the minimum measured concentration over an extended period of time (e.g., days or weeks);

Comment: this definition of baseline is different than the baseline concentration associated with environmental impact assessments which is based on 90th percentile concentration measured over a period of time. Both are associated with monitoring data. There may be potential for confusion. | The definition for "baseline concentration" applies to data QA/QC procedures and is defined here for the purposes of the AMD. It is used in the context of baseline shift. | Modified definition to read: "baseline concentration" (pertaining to ambient data verification) means the minimum measured concentration over an extended period of time (e.g., days or weeks). |
| 46 | Definition: "invalid data" means data which do not satisfy the quality assurance objectives set out in the AMD or a person's Quality System;

Comment: how is "person' defined? Is the "person responsible"? | Should be "person responsible's Quality System" | Changed definition to read "person responsible's" instead of "person". |