Appendix D. Data Base Quality Assurance and Quality Control Plan

Quality assurance is an integrated system of management activities which involves planning, standard operating procedures, training, work performance, quality assessment, and quality improvement to ensure that the end product meets all stated levels of confidence. Quality assurance encompasses the organization within which quality control activities are performed. Such is the philosophy and practice involved in developing the Phase I and Phase II data bases.

From experience in developing the previous Phase I and Phase II data bases, we recognize that processing mistakes and inaccuracies can and do occur. To create safeguards against missed data, incorrect data interpretation, and data entry errors, we recognize the need to be *proactive and reactive* in building collective, comprehensive QA measures: proactive in the sense of establishing concrete planning procedures and performance guidelines prior to work initiation; reactive in the sense of being sensitive and responsive to inadvertent and systematic shortcomings. An important key step is to build in quality review measures and to identify and implement improvements to the systematic processing of the reported data.

To enhance quality assurance in developing the data bases, we followed the following philosophy and procedures:

Quality Assurance Philosophy

Quality work is produced from personnel with:

- Clear understanding of the purpose of the work and overall project objectives.
- Clear understanding of the data base contents and requirements.
- Background in HWC design and operation, APCS operations, environmental testing programs, measurement methods, and MACT rulemaking.
- Sense of pride/purpose in work.
- Organization and attention to detail.

Data Base Design

- Simplify data base design to the degree possible.
- Make data base fields and structure self-explanatory to the degree possible.
- Minimize/eliminate redundant data entry requirements.

1. Capitalize on opportunity for data base design evolution; after initial utilization, perform

critical review and evaluation of the design limitations, then identify and implement improvements.

Data Entry Personnel Training

- Understand purpose of the data base.
- Review results of previously processed test reports.
- Review contents and fields of the data base.
- Process a report. Have work reviewed by experienced personnel to provide feedback on quality. Continue this feedback process sequence until report processing is of highest quality.

Test Report Review Procedures

- Before data entry, review report to identify:
  - -- Number of different sources for which stack gas testing is performed.
  - -- Unit design and operation, including combustor type, APCS, waste types, and operating characteristics.
  - -- Number of different test conditions tested, and purposes of each test condition.
  - -- Measurements taken -- stack gas measurements, feedstream and other process operating measurements.
  - -- Report organization -- extent and location of key data tables and corresponding descriptions of test conduct and any technical problems with process operations, sampling, or sample analysis.
- Assign unit ID No. to each different combustor.

Data Entry Procedures / Guideline

- Philosophy
  - -- Emphasize prevention of data errors by entering correctly the first time.
  - -- Minimize/eliminate redundant data entry requirements by maximizing cell linkages
- Enter all pertinent data regardless if incomplete at the time to avoid possible data bias.

Make a note of incomplete data, and attempt to request what is missing. Fill in later as additional data is received. Omit incomplete data in analysis as necessary.

- Enter data exactly as reported in test report to ensure data traceability / data origin and to facilitate review.

- Enter data in preferred final units -- stack gas concentrations corrected to 7% O_2 -- when available in the test report as a first choice. Enter data in other units (e.g., mass emissions rates (lb/hr)) when it is only available in these units.

- Enter data on a run-by-run basis for each test condition.

- Enter all available non-feedrate related process information that can be used to characterize the tested operating conditions.

Data Evaluation

- Identify and double check apparent outliers through evaluation of data:

  -- Compare three runs at the same test condition.

  -- Compare data within similar type of units.

  -- Compare data with that expected from engineering judgement.

- Second party review of selected test report and data base entries to identify missed data, incorrect data interpretation, and data entry errors.

- Random or systematic spot checks.

Data Changes

- Document all changes (dates and person making change) to data base.