



Quality Assurance Project Plan (QAPP) Review Checklist

March 2016

Alaska Department of Environmental Conservation
Division of Environmental Health
Solid Waste Program

The Alaska Department of Environmental Conservation (ADEC) Solid Waste Program has provided this checklist to outline the minimum required content for a Quality Assurance Project Plan (QAPP) (aka Groundwater Monitoring Plan) for landfill groundwater monitoring. ADEC can and will require additional information on a site-specific basis. This checklist is not intended as a comprehensive groundwater monitoring guidance. For additional guidance please refer to other ADEC guidance documents.

Project Management

- Title Page
- Distribution List
- Table of Contents
- Project/Task Organization – identify key project team members and their respective roles and responsibilities (facility manager, operator, environmental project manager, hydrogeologist, field sampler, chemist, statistician, etc.). May be provided in table format

Problem Formulation/Background

- State purpose of plan, decisions to be made, or outcome to be achieved
- Background information: historical, scientific, and regulatory perspective for the monitoring project, including:
 - Facility location, local geology and hydrogeology, and monitoring program history and current status
 - Identify monitoring well locations and indicate up/downgradient and current status (active or inactive, water level measurement only, etc.)
 - Provide well logs and any additional well installation information
 - Constituents monitored for and why any Appendix I or Appendix II constituents have been removed from the list, and attach ADEC approval letter
- Cite applicable regulatory or program-specific quality standards, criteria, or objectives
 - Type of monitoring (detection or assessment) and applicable regulations
 - Compliance criteria [background or Groundwater Protection Standard (GWPS)]
 - Dates of scheduled monitoring events

Project/Task Description

- Provide summary of the monitoring program and monitoring network (purpose and intent, identification of wells, etc.)
- Facility map with monitoring locations and predominant groundwater flow direction and rate
- Monitoring schedule information
 - Frequency of scheduled monitoring events
 - Timing of scheduled monitoring events (or an acceptable range)

Data Quality Objectives and Criteria

- State all data quality objectives (DQOs) and specify performance criteria
 - Include a list of all monitoring locations to be sampled during each monitoring event
 - Specify the constituents to be evaluated at each monitoring location

- Indicate how non-conformance issues will be identified and documented, and the process for determining corrective actions

Special Training/Certification

- Identify any specialized training or certifications required and provide documentation of that training for project team members

Documents and Records

- Describe and identify all documents that will be produced under the QAPP, the format for those documents, how they will be distributed, and the document retention policy

Data Generation & Acquisition

Sampling information:

- Sample Identification
- Number of samples
- Sampling rationale
- Sample locations and frequency of sampling
- Constituents or parameters to be measured

Sampling Procedures:

- Groundwater level measurements - how groundwater elevations will be determined and recorded including:
 - Measuring procedures and precision (laser, tape, tape with sensor, nearest 0.01foot, etc.)
 - Exact locations where measurements will be taken (mark on top of casing)
 - How often wells will be resurveyed and criteria
 - How data will be reported - field logs and summarized in a report table
- How flow direction and velocity will be calculated, assessed, and reported including:
 - Number of data points used in the calculation
 - Specific information on any special calculator tool used such as SMARTe
 - Verification of historical groundwater flow and any contradictions
- Water quality parameter stabilization criteria (See CS [Field Sampling Guidance](#))
- Sample Collection Equipment
 - Pump - peristaltic pump, bladder pump, etc.
 - Type of tubing
 - Certified pre-cleaned sample containers
 - Other consumables (Personal Protective Equipment, etc.)
- Sampling methods (Method name and SW-846 method number)
- Sample preservation & hold time (See CS [Field Sampling Guidance](#))
- Decontamination and disposal procedures
 - Use of disposable equipment
 - Decontamination of reusable equipment

Field Sampling Performance Standards

- Instrument checks and calibration procedures
- Identify how non-conformance issues will be identified and documented, and the process for determining corrective action

Sample Handling and Chain of Custody (COC) Procedures – describe how chain of custody will be maintained from sample collection through delivery to the lab (Note: labs must maintain COC if they transfer samples to another lab)

- How field procedures will be documented
 - Field log
 - Monitoring Well Sampling forms
 - Chain of custody form
- Sampler credential requirements
- Sample collection and management in the field (collected all at once or over multiple days, sample storage, etc.)
- Sample transport to lab (hand delivered, Gold Streak, etc.)

Analytical Methods

- Analytical lab and applicable certifications or approvals
- Analytical methods
- Method detection limits for all monitored constituents
- Confirmation of analytical detection limit adequacy to meet monitoring program objectives (prior to analysis)
- Analytical turn-around time (TAT) – standard TAT is 30 days
- Identify who will manage lab contract to ensure all lab analyses are done in accordance with QAPP

Quality Control (QC)

- Field equipment use, maintenance, and verification – including manufacturer manual suggested instrument calibration and frequency, use, decontamination, calibration verification
- Field QC samples
 - Field duplicates – identify procedures and frequency (1 per 10 samples or at least 1 per sampling event)
 - Trip blank – must be submitted with all volatiles samples [gasoline range organics (GRO), volatile organic compounds (VOC), ethylene dibromide (EDB), etc.]
 - Equipment blank – procedures, frequency, details on how results will be reported and assessed
 - Temperature blank – must be included in each sample cooler
- Laboratory QC Samples
 - Method blanks
 - Lab duplicates
 - Lab Control Spike/Duplicates
 - Matrix Spikes/Duplicates
 - Surrogate Spikes
- Data quality objective evaluations
 - Accuracy
 - Precision
 - Completeness
 - Sensitivity
 - Comparability
 - Representativeness
- Data Assessment – describe how data will be assessed for usability
 - Data Reduction – what result will be used ([See CS Tech Memo Guidelines for Data Reporting, Data Reduction, and Treatment of NDs](#))
 - Field duplicates – use most conservative (highest for compliance; lowest for background)
 - Results from multiple analyses – use more definitive method or most conservative result

- Comparison to DQO's – detection limit adequacy, compliance with QA/QC criteria
- Guidelines for identifying and handling non-conformances (what to do when things go wrong)
- Corrective actions (reanalysis, reporting data with qualifications, resampling, etc.)
- Data qualifications
 - How data will be qualified (flagged) – provide reference to EPA's National Functional Guidelines or other guidance
 - Define data flags to be used
 - Impact on data usability – biased high or low or rejected (cannot be used at all)

Data Management – describe how data will be managed from generation to final reporting

- Record keeping
- Data storage and retrieval – all historical monitoring data should be available
- Data handling
- Programs/software used to process, compile, analyze data (Access, Excel, etc.)

Statistical approach – identify:

- Statistical approach
- Error levels
- Distribution testing
- Data reduction for statistical analysis
 - Duplicate data – use more conservative result (Highest for compliance. Lowest for background)
 - Non-detects
 - Kaplan-Meier or bootstrap method recommended where sufficient data available (depends on percentage of NDs)
 - Highest ND detection limit if not enough data
 - All Qualified Data – should be used as is (discuss any potential bias as an uncertainty). Rejected data should not be used at all
 - Statistical outliers – include background testing procedures and evaluation criteria for eliminating any data point; outliers may only be eliminated in background analysis unless field or lab error can be confirmed
- Background determination – include how it will be calculated and how often it will be updated
- Retesting
 - Retesting Scheme (if used) – approach and implementation (when and how)
 - Double Quantification Rule (if used) – approach and implementation (when and how)
 - Any other confirmatory testing not built in to the statistical approach

Reporting

- Reporting schedule – frequency of reporting (quarterly, semi-annual, annual) and when reports will be submitted (within 60 days of data receipt)
- Retesting and resampling reporting schedule (if applicable)
- Report format – electronic draft, red-line strike-out review, final hardcopy with CD, etc.
- Review process
 - Who develops reports?
 - Who reviews them?
 - Review schedule
 - Reconciliation of comments and final approval