



Quality Assurance Project Plan (QAPP)

The Alaska Department of Environmental Conservation (ADEC) Solid Waste Program is providing 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 Solid Waste Program guidance documents available at <http://dec.alaska.gov/eh/solid-waste>.

CHECKLIST DESCRIPTION		PAGE/SECTION
Project Management		
1.	Title page	
2.	Distribution list	
3.	Table of contents	
4.	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.). This may be provided in a table format.	
Problem Formulation/Background		
5.	State purpose of plan, decisions to be made, or outcome to be achieved	
6.	Background information - historical, scientific, and regulatory perspective for the monitoring project including:	
	a. Facility location, local geology and hydrogeology, and monitoring program history and current status	
	b. Identify monitoring well locations with up/downgradient indicated, and current status (active or inactive, water level measurement only, etc.)	
	c. Provide well logs and any additional well installation information	
	d. Constituents monitored for and why any 40 CFR 258 Subpart G Appendix I or Appendix II constituents have been removed from the list, and attach ADEC approval letter	
7.	Applicable regulation or program – specific quality standards, criteria, or objectives	
	a. Type of monitoring (detection or assessment) and applicable regulations	
	b. Compliance criteria - background or Groundwater Protection Standard (GWPS)	
Project/Task Description		
8.	Facility map with monitoring locations and predominant groundwater flow direction and rate	
9.	Monitoring schedule information	
	a. Frequency of scheduled monitoring events	
	b. Timing of scheduled monitoring events (or an acceptable range)	
Data Quality Objectives and Criteria		
10.	State all data quality objectives (DQOs) and specify performance criteria	
	a. Include a list of all monitoring locations to be sampled during each monitoring event	
	b. Specify the constituents to be evaluated at each monitoring location	
11.	Indicate how non-conformance issues will be identified and documented, and the process for determining corrective actions	

CHECKLIST DESCRIPTION		PAGE/SECTION
Special Training/Certification		
12.	Identify any specialized training or certifications required and provide documentation of that training for project team members	
Documents and Records		
13.	Describe and identify all documents that will be produced under QAPP, the format for those documents, how they will be distributed, and the document retention policy	
Data Generation and Acquisition		
14.	Sampling information	
	a. Sample identification	
	b. Number of samples	
	c. Sampling rationale	
Sampling Procedures		
15.	Groundwater level measurements – how groundwater elevations will be determined and recorded including:	
	a. Measuring procedures and precision (laser, tape, tape with sensor, nearest 0.01 foot, etc.)	
	b. Exact locations where measurements will be taken (mark on top of casing)	
	c. How often wells will be resurveyed and criteria	
	d. How data will be reported - field logs and summarized in a report table	
16.	How flow direction and velocity will be calculated, assessed, and reported including:	
	a. Number of data points used in the calculation	
	b. Specific information on any special calculator tool used such as SMARTe	
	c. Verification of historical groundwater flow and any contradictions	
17.	Water quality parameter stabilization criteria (See Contaminated Sites Program [CS] Field Sampling Guidance)	
18.	Sample collection equipment	
	a. Pump - peristaltic pump, bladder pump, etc.	
	b. Type of tubing	
	c. Certified pre-cleaned sample containers	
	d. Other consumables (Personal Protective Equipment, etc.)	
19.	Sample preservation and hold time (See CS Field Sampling Guidance)	
20.	Decontamination and disposal procedures	
	a. Use of disposable equipment	
	b. Decontamination of reusable equipment	
Field Sampling Performance Standards		
21.	Instrument checks and calibration procedures	
22.	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.)		
23.	How field procedures will be documented	
	a. Field log	
	b. Monitoring well sampling forms	

CHECKLIST DESCRIPTION		PAGE/SECTION
	c. COC form	
24.	Sampler credential requirements	
25.	Sample collection and management in the field (collected all at once or over multiple days, sample storage, etc.)	
26.	Sample transport to lab (hand delivered, Gold Streak, etc.)	
Analytical Methods		
27.	Analytical lab and applicable certifications or approvals	
28.	Analytical methods	
29.	Detection and quantitation limits for all monitored constituents (Detection Limit, Limit of Detection, and Limit of Quantification must be provided by laboratory, refer to Department of Defense (DoD) fact sheet for definitions).	
30.	Confirmation of analytical detection limit adequacy to meet monitoring program objectives (prior to analysis)	
31.	Confirmation of laboratory adequacy for analytical limit reporting requirements (prior to analysis). Refer to DoD factsheet for reporting requirements.	
32.	Analytical turn-around time (TAT) – standard TAT is 30 days	
33.	Identify who will manage lab contract to ensure all lab analyses are done in accordance with QAPP	
Quality Control (QC)		
34.	Field equipment use, maintenance, and verification – including manufacturer manual, instrument calibration and frequency, use, decontamination, and calibration verification	
35.	Field QC samples	
	a. Field duplicates – identify procedures and frequency (1 per 10 samples or at least 1 per sampling event)	
	b. Trip blank – must be submitted with all volatiles samples [gasoline-range organics (GRO), volatile organic compounds (VOC), ethylene dibromide (EDB), etc.]	
	c. Equipment blank – procedures, frequency, details on how results will be reported and assessed	
	d. Temperature blank – must be included in each sample cooler	
36.	Laboratory QC Samples	
	a. Method blanks	
	b. Lab duplicates	
	c. Lab control spike/duplicates	
	d. Matrix spikes/duplicates	
	e. Surrogate Spikes	
37.	Data Quality Objective Evaluations	
	a. Accuracy	
	b. Precision	
	c. Completeness	
	d. Sensitivity	
	e. Comparability	
	f. Representativeness	
38.	Data assessment - describe how data will be assessed for usability	

CHECKLIST DESCRIPTION		PAGE/SECTION
	a. Data reduction – what result will be used (See CS Tech Memo Treatment of Non-Detect Values, Data Reduction for Multiple Detections and Comparison of Quantitation Limits to Cleanup Values)	
	i. Field duplicates – use most conservative (highest for compliance; lowest for background)	
	ii. Results from multiple analyses – use more definitive method or most conservative result	
	b. Comparison to DQOs – detection limit adequacy, compliance with QA/QC criteria	
	c. Guidelines for identifying and handling non-conformances (what to do when things go wrong)	
	d. Corrective actions (reanalysis, reporting data with qualifications, resampling, etc.)	
	e. Data qualifications	
	i. How data will be qualified (flagged) – provide reference to EPA’s National Functional Guidelines or other guidance	
	ii. Define data flags to be used	
	iii. 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.		
39.	Record keeping	
40.	Data storage and retrieval – all historical monitoring data should be available	
41.	Data handling	
42.	Programs/software used to process, compile, analyze data (Access, Excel, etc.)	
Statistical Approach		
Identify the following:		
43.	Statistical approach	
44.	Error levels	
45.	Distribution testing	
46.	Data reduction for statistical analysis	
	a. Duplicate data – use more conservative result (highest for compliance; lowest for background)	
	b. Non-detects	
	i. Kaplan-Meier or bootstrap method recommended where sufficient data available (depends on percentage of non-detects [ND])	
	ii. Highest ND detection limit if not enough data	
	iii. Analytical limit used for ND results	
	c. All qualified data – should be used as is (discuss any potential bias as an uncertainty) and rejected data should not be used at all	
	d. 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	
	e. Background determination – include how it will be calculated and how often it will be updated	
	f. Retesting	
	i. Retesting scheme (if used) – approach and implementation (when and how)	

CHECKLIST DESCRIPTION		PAGE/SECTION
	ii. Double quantification rule (if used) – approach and implementation (when and how)	
	iii. Any other confirmatory testing not built in to the statistical approach	
Reporting		
47.	Reporting schedule – frequency of reporting (quarterly, semi-annual, annual) and when reports will be submitted (within 90 days of sampling event)	
48.	Retesting and resampling reporting schedule (if applicable)	
49.	Report format – electronic draft, red-line strike-out review, final hardcopy with CD, etc.	
50.	Review process	
	a. Who develops reports?	
	b. Who reviews them?	
	c. Review schedule	
	d. Reconciliation of comments and final approval	

Resources

- ADEC Solid Waste Program guidance documents: <http://dec.alaska.gov/eh/solid-waste.aspx>
- ADEC CS *Field Sampling Guidance*: <http://dec.alaska.gov/spar/csp/guidance-forms/>
- Department of Defense (DoD) Fact Sheet: <https://www.denix.osd.mil/edqw/home/what-s-new/unassigned/detection-and-quantitation-fact-sheet/>
- ADEC CS Tech Memo *Treatment of Non-Detect Values, Data Reduction for Multiple Detections and Comparison of Quantitation Limits to Cleanup Values*: <http://dec.alaska.gov/spar/csp/guidance-forms/>