

Brownfields Grant Recipients' Road Map to Understanding Quality Assurance Project Plans

Purpose of this Roadmap

The U.S. Environmental Protection Agency (EPA) prepared this publication to help recipients of an EPA Brownfields Assessment Grant (recipients) design and complete site assessment projects more efficiently and effectively by increasing their awareness and understanding of the importance of quality assurance (QA) in brownfields site projects. This document also provides an overview of EPA requirements for developing generic and site-specific quality assurance project plans (QAPP) and site-specific QAPP addendums (collectively 'QAPPs') in support of site assessment efforts at brownfields sites. Readers are advised that specific QAPP requirements will vary by EPA region and state. Finally, the document outlines a general process to help recipients oversee their environmental contractor's efforts to develop QAPPs to ensure collection of adequate and appropriate data to support the decision-making processes needed to determine and support protective future uses of brownfields sites.

Quality assurance (QA) for Brownfields sites involves planning and managing the process for gathering and using environmental data to ensure they are of the right type, quantity and quality necessary to make a decision. The quality assurance project plan (QAPP) documents the quality process and addresses in the appropriate formats the specific quality elements required by the relevant EPA region and state.

Quality Assurance – What It Is and Why It's Important

Most people consider the quality of a product or service before they decide to purchase it. As a result, manufacturers and service providers are compelled to implement QA to ensure customers are satisfied with their products and services. QA includes organizing and planning for quality; collecting data and completing

quality control (QC) checks; documenting, evaluating and reporting QC check findings; and acting to address identified quality issues. Successful QA processes are thorough, well-documented and designed to ensure that the outcomes achieved meet the quality required. For environmental projects, QA processes are implemented to ensure that the data obtained in support of environmental assessment and cleanup are of an appropriate quality for their intended purposes. This level of quality is critical because these data drive decisions regarding the need for, and degree of, remediation and other controls required at a site to protect human health and the environment.

The Brownfields QAPP Road Map below illustrates the general process for developing, submitting and obtaining approval of Brownfields QAPPs.

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The EPA requires that a QAPP be prepared to support all federally funded environmental projects involving the collection, evaluation, use and reporting of environmental data.

<https://www.epa.gov/quality/epas-quality-system-related-regulations>

Preparation Activities

- ✓ Review this Road Map and other QAPP-related resources
- ✓ Contact your EPA Brownfields project officer
- ✓ Contact state project manager and others recommended by the EPA Brownfields project officer (such as EPA QA personnel)
- ✓ Obtain, review and share available tools, resources, formats and guidance specific to the EPA region and state

General Process for Completing QAPPs for Brownfields Sites

This document describes the general process that recipients can follow to prepare for, develop and implement generic QAPPs, site-specific QAPPs and site-specific QAPP addendums. It identifies the basic components of a QAPP and describes the organizational relationships and typical roles and responsibilities of those directly involved in QAPP development and implementation. More information on the performance of Brownfields site assessment and cleanup efforts is available in the *"Brownfields Road Map to Understanding Options for Site Investigation and Cleanup, Sixth Edition,"* which is available for download and interactive access at <https://www.epa.gov/brownfields/brownfields-road-map>.

The general steps and activities described are supported by a companion checklist included in [Appendix A](#), which recipients can use to track the progress of QAPP development efforts on their projects. The checklist is primarily provided for recipients with limited to no prior Brownfields site assessment project experience; as sometimes may be the case for city planners, community or development coordinators, city administrators, city engineers or elected officials.



Prepare for QAPP Development Effort

The first step in preparing for QAPP development is to understand its purpose and the general process and activities involved. The main purpose of a QAPP is to serve as the instruction manual or 'game plan' for site assessment or cleanup, with specific emphasis on ensuring the quality of field sample and measurements data collection, sample analysis and subsequent data validation, evaluation and reporting. Due to its collaborative nature, the QAPP development process helps ensure that key project stakeholders have a common understanding of technical quality and performance expectations.

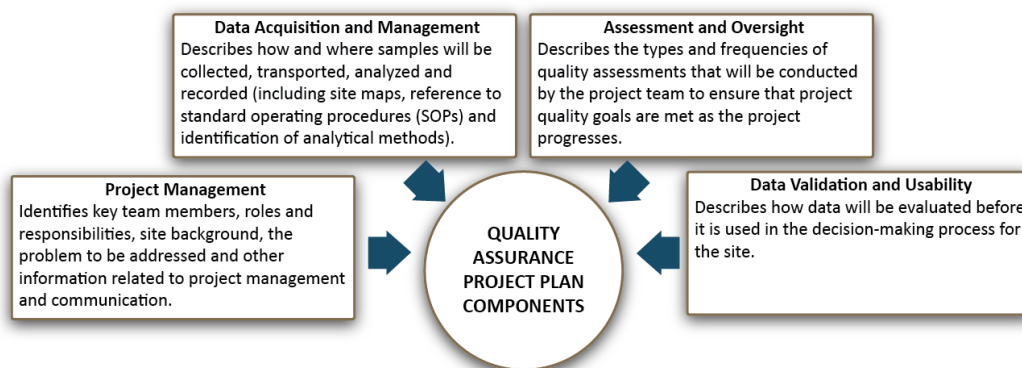
A generic QAPP may be developed when a recipient's Brownfields program involves more than one site and is designed to accommodate technical requirements common to all the sites. A site-specific QAPP addendum supplements the generic QAPP, usually in the form of a sampling and analysis plan (SAP) and addresses the additional and unique technical issues of performing a site assessment at a particular site. Site assessment goals, approaches and technologies can differ significantly for each site based on variability in major site attributes such as contaminant types, depth of groundwater, site geology, overall site conditions and accessibility. If one or more sites of interest in a multi-site program are known at the time, there are schedule and cost benefits in developing the generic QAPP and site-specific QAPP addendum simultaneously, or alternatively, separate standalone site-specific QAPPs. Otherwise, the documents are typically developed and approved

in succession. A standalone site-specific QAPP includes all of the elements of a generic QAPP and SAP and is developed for application to one site.

Generally, there are four major components of a QAPP; each comprised of a number of subcomponents that address key information required to execute a quality project. Figure 1 provides an overview of these components; while [Appendix B](#) lists and describes each subcomponent in detail.

Different EPA regions and states have unique technical requirements and organizational and procedural aspects for implementing and overseeing QAPP development (For information on Regional resources, see “Regional QA Technical Resources Webpages” on page 13). Recipients should communicate with their Regional EPA Brownfields project officer and state Brownfields project manager to confirm the specific QAPP requirements and process used for Brownfields QAPPs in their location. In addition, cooperative agreement recipients need to identify and obtain input from other potentially significant decision-makers for their projects and sites; such as other state regulating agencies; and state, county and city planning and development organizations.

Figure 1 – General Quality Assurance Project Plan Components



The responsible federal and state personnel can provide resources such as guidance documents (beyond those listed in the references on pages 12-14), QAPP outlines and templates, and examples of QAPPs previously approved for similar projects. Because QAPPs are scalable, the cost and time to produce them can vary, so recipients should seek clarity on the appropriate amount of information and degree of detail needed to support their program and site projects. The EPA or state may also encourage the use of streamlined formats, such as the Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP) (IDTQF, 2004) to expedite QAPP development and review, as well as innovative strategies and field-based screening technologies to support more effective site assessments.

Typical Types of QAPPs

Generic QAPP – applies to all sites in a multi-site program.

Site-Specific QAPP Addendum – applies to a single site in a multi-site program. Commonly submitted in the form of a sampling and analysis plan (SAP). Attaches to the overarching Generic QAPP.

Site-Specific QAPP – submitted when a Brownfields project is limited to one site or when separate QAPPs are developed for each site in a multi-site program. Includes a SAP. This is a standalone document.

Step 1 Activities

- ✓ Establish project team
- ✓ Identify other needed team members and begin to locate them
- ✓ Initiate development of Project Management components of QAPP using the formats obtained under Step 1
- ✓ Identify State and Regional requirements applicable to the site
- ✓ Prepare an RFP to hire a contractor and/or laboratory to complete the Project Team



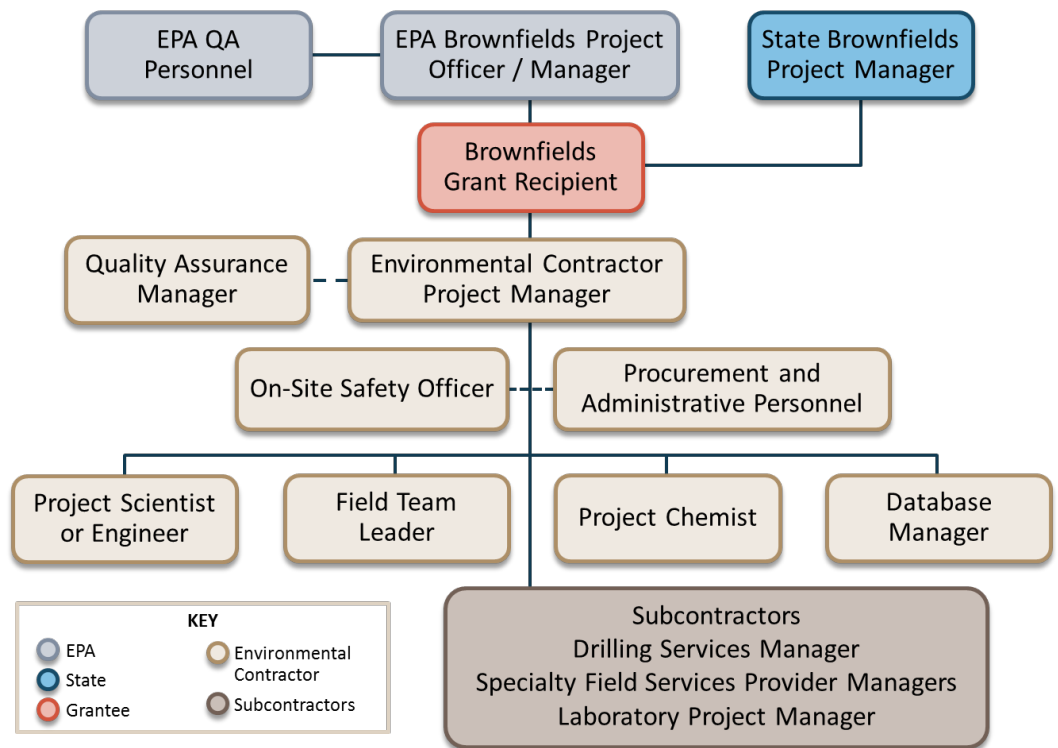
Step 1: Establish Project Team

The typical Brownfields recipient's project team includes personnel from the recipient's organization, personnel from the recipient's environmental contractor and the contractor's subcontractors (such as drillers, specialty field services providers and laboratories). Regional EPA and state Brownfields personnel support the team with guidance, quality review and QAPP approval authority.

In close partnership with the recipient, the environmental contractor typically leads the technical design and execution of the Brownfields site assessment project; including, but not limited to, QAPP development, field and analytical program implementation and project reporting. In addition, environmental contractors frequently provide recipients with technical and outreach support for meetings and presentations to the EPA, state, other project stakeholders and the community at large. If a recipient has more than one environmental contractor, each will develop QAPPs and support the recipient with additional services for the projects they are assigned to support.

Figure 2 shows the organizational structure and roles of a typical Brownfields cooperative agreement recipient's site assessment team, including the relationships with Regional EPA and state personnel and the significant role of the environmental contractor and its subcontractors.

Figure 2 – Typical Brownfields Grant Recipient's Site Assessment Project Team



Note: The environmental contractor's team composition will differ for a site cleanup effort, particularly in the type and number of personnel disciplines and subcontractor service areas.

Table 1 describes the various responsibilities and project roles of environmental contractor personnel in relation to QAPP development, site assessment and project reporting.

Table 1 – Typical Environmental Contractor's Team Roles and Responsibilities

Role	Responsibilities
Project Manager	Responsible for project planning, execution and quality of performance. Coordinates with the recipient and supports technical discussions with the Regional EPA Brownfields project officer, state regulatory agencies, members of the contractor project team and other site decision-makers. Manages and provides technical oversight during QAPP development, field data collection and reporting efforts. Reports to corporate Principal-in-Charge of grantee's contract and task order.
Procurement and Administrative Personnel	Supports the review, negotiation and execution of the recipient's contract and task orders. Provides services for the competitive solicitation, evaluation and award of subcontracts to drillers, specialty field services providers and analytical laboratories. Administers invoices to the recipient and issues payments for approved services performed by subcontractors. Reports to corporate management.
Quality Assurance Manager	Responsible independent review of all project activities and deliverables and supporting the resolution of any identified QA issues. Has authority to suspend project activities if quality requirements are not being met. Reports to corporate management. All project personnel are required to be responsive to the QA Manager's input, guidance and directives as related to assuring project quality.
On-site Safety Officer	Helps develop the QAPP and the health and safety plan (HASP). Responsible for field team's HASP compliance and implementing appropriate site control measures and personal protection levels based on identified potential site hazards. Conducts safety briefings for all field personnel and site visitors. Can suspend operations that threaten health and safety. Reports to corporate health and safety management.
Project Scientist or Engineer	Helps design and develop the generic QAPP and site-specific QAPP addendums (usually SAPs), or the site-specific QAPP, including the site assessment strategy and the numbers, types and locations of samples and specialty measurements. Helps project team and site decision-makers understand site issues that affect decision-making.
Field Team Leader	Responsible for directing day-to-day field activities during site assessment. Verifies that field sampling and measurement procedures comply with all QAPP field-related requirements. Provides project manager with regular reports on status of field activities and notifies of any deviations from the QAPP.
Project Chemist	Helps define analytical requirements for the generic QAPP and site-specific QAPP addendums (usually SAPs), or the site-specific QAPP. Coordinates with subcontractor laboratory project manager on analytical requirements, delivery schedules and logistics, data validation and evaluation and project reporting efforts.
Database Manager	Responsible for capturing, storing and managing project data. Ensures the flow of project data in formats that meet the requirements specified in the generic

Role	Responsibilities
	QAPP and site-specific QAPP addendum, or site-specific QAPP. Advises the project team on the proper database methods for entering, managing and reporting data.
Subcontractor Driller and Specialty Field Services Provider Managers	Review SAP portion of site-specific QAPPs and site-specific QAPP addendums to understand project drilling, sampling and specialty field service requirements, respectively. Work with the field team leader to ensure successful delivery of services; including securing utility clearances and property access approvals for sampling and measurement efforts. Work with the project scientist/engineer to ensure provision of required data deliverables, both manual and electronic.
Subcontractor Laboratory Project Manager	Reviews site-specific QAPPs and site-specific QAPP addendums to understand project analytical methods and related quality requirements. Works with the project chemist to confirm analytical requirements, delivery schedules, project reporting, and data quality assessments and resolutions.

Note: The above roles and responsibilities are subject to change as a function of any future revisions to EPA QAPP guidance.

Depending on project and site complexity, it may be beneficial for the brownfields cooperative agreement recipient and its contractor to meet with the EPA, state Brownfields, and appropriate QA personnel who can provide input on the technical requirements that will apply to the recipient's Brownfields program or site(s). This interaction may occur through one or several meetings where QAPP development and other matters related to site assessment and potential remediation are discussed.

To comply with the terms and conditions of brownfields cooperative agreements federal funding requirements, cooperative agreement recipients must competitively procure the services of environmental contractors. Once hired, environmental contractors must competitively procure the services of subcontract drillers, specialty field services providers and laboratories. Procuring environmental contractor support is generally accomplished by issuing a request for proposal (RFP), reviewing proposals and selecting the most capable and responsive parties. The RFP for services must clearly and specifically describe the statement of the work for the project, the tasks, responsibilities, schedule (particularly if driven by Brownfields grant funding), deliverables and level of quality the environmental contractor and its subcontractors are expected to achieve. The RFP should include site background information, if available, and references to federal, state or local requirements (for example, laws, special training and document formats) that will apply to the project. If not familiar with these requirements, recipients should minimally require that the environmental contractor and its subcontractors meet all applicable federal, state and local training and professional certification requirements and comply with all applicable laws and regulations, including those regarding worker and public health and safety.

Many Brownfields sites are addressed under state cleanup programs. Each of these programs may have specific requirements that can affect the QAPP and site work, including:

- Action levels for future uses
- Sampling and analytical method requirements
- Processes for gaining approval to use innovative strategies and technologies
- Data evaluation requirements
- Training and certification requirements
- Document contents and formats

The RFP typically requires the environmental contractor to provide a technical approach that describes how project goals and quality requirements will be achieved. The environmental contractor is then required to illustrate its qualifications and past performance record using previous project examples, resumes and references. The RFP also should require that the environmental contractor include in its submittal a subcontracting plan. The RFP should emphasize that the environmental contractor must prepare complete QAPPs of a level of quality that will successfully result in EPA and state approval; however, the recipient must work with the environmental contractor to help achieve this outcome.

Various EPA and related resources are available to support RFP development and proposal review and can be found on EPA's Brownfields and Land Revitalization website (<https://www.epa.gov/brownfields>).

Cooperative Agreement Recipients are advised to communicate with their Regional EPA and state Brownfields representatives to seek their input on hiring contractors. The representatives can also provide information on other entities that provide technical and procurement resources and support under EPA-funded programs. Finally, communicating with other area Brownfields cooperative agreement recipients, checking references and getting input from state or Regional parties on past project results will help in evaluating proposals and selecting a qualified environmental contractor. Once selected, recipients should work with the environmental contractor to outline project management and communications approaches for the program and site projects. This information should be incorporated into the generic QAPP and, as relevant, the site-specific QAPP or site-specific QAPP addendum. Clear communication plans are critical for projects where innovative strategies and technologies are planned for use, as they typically require more frequent and sometimes near real-time data submittals.



Step 2: Develop Data Quality Objectives and Decision Criteria

Having already prepared and included project information in the Brownfields grant application, recipients likely have a number of background documents and other information about the site(s) and surrounding areas. The environmental contractor typically conducts a Phase I ESA. Gathering this information includes the following activities:

- Review site information
- Conduct a more comprehensive search for site documentation.
- Perform an on-site investigation of the brownfield property.
- Review any other information, including input from the EPA and state representatives, to develop the conceptual site model (CSM) for the site(s) of concern.

Step 2 Activities

- ✓ Develop conceptual site model (CSM)
- ✓ Identify data gaps
- ✓ Develop quality objectives and criteria (including “if-then” statements)
- ✓ Confirm and document special training or certification requirements
- ✓ Identify the documents and records to be developed and maintained
- ✓ Obtain stakeholder and decision-maker input on these portions of the QAPP

A conceptual site model (CSM) is a critical project quality planning tool and should be developed for every Brownfields site assessment project.

The CSM is a critical prerequisite for developing a site-specific QAPP or site-specific QAPP addendum. The CSM summarizes what is known, suspected and unknown about the site. The CSM serves as the foundation to identify site data gaps that form the basis for questions that need to be answered by site assessment efforts. The data gaps directly drive the design of the Sampling and Analysis Plan (SAP), including:

- Media (e.g., soil, groundwater, air) to be assessed.
- Strategy and methods to be used to complete sampling.
- Numbers of samples to be collected and measurements made.
- Analytical methods.
- Other factors that provide the basis for developing project and data quality objectives and decision criteria.

Establishing decision criteria requires the recipient and project team to work with decision-makers to identify the specific decisions that need to be made, identify who can make what type of decision and establish decision rules that will be applied to the data collected. Decision rules can be documented in a decision flow chart or as a series of “if-then” statements that link data collected to a decision that needs to be made for the project or site. The following “if-then” decision rules are provided as examples only, and should not be interpreted as being appropriate or required statements for all sites:

- **If** concentrations of contaminant X in the top 6 inches of soil in the southern portion of the site are below 150 milligrams per kilogram (mg/kg), **then** that portion of the site may be developed as a children’s soccer field.
- **If** concentrations of contaminant X in the top 6 inches of soil in the southern portion of the site exceed 150 mg/kg, but are less than 500 mg/kg, **then** that portion of the site may be developed as a golf driving range.
- **If** concentrations of contaminant X in the top 6 inches of soil in the southern portion of the site are above 500 mg/kg, **then** that portion of the site may not be developed and must be remediated.

After decision rules are developed for the site, criteria must be developed to describe the level of data quality and procedures required to provide a sound basis for making each decision. For the “if-then” example above, such criteria might specify that measurements of contaminant X must be accurate to within a defined percent of the actual concentrations. Obtaining EPA and state input on acceptable levels of accuracy will ensure the data collected and analyzed are sufficient to make remedial decisions described by the “if-then” decision rules.

It is particularly important to communicate with state representatives, who must approve the proposed future reuse for the Brownfields site, to ensure the

The specific information needs of key site decision-makers must be addressed in the QAPP.

information needed to support their site-related decision-making will be collected. These representatives may be assigned to different offices than the state QA representatives who are responsible for reviewing the QAPP.

The project team determines the field documentation, data deliverables and formats that must be produced during data collection and reporting to support decision-making; the QAPP describes these requirements. Certain site objectives, criteria and documents may be specific to the region and state where the site is located and the cleanup program that regulates the site (for example, a state voluntary cleanup program). Therefore, it is critical to ensure that the team integrates any location- or program-specific requirements. The EPA and state Brownfields representatives and the environmental contractor should be able to help recipients plan ahead to avoid missing a requirement that could hinder the project down the line. Obtaining frequent input from the team and other stakeholders will also help keep the project on the right track.

Step 3: Develop Draft QAPP



After developing and reaching consensus on the CSM, data gaps, project and data quality objectives, decision criteria and rules, the Draft QAPP can be developed. Various components of a Draft QAPP are typically developed by different members of the environmental contractor's project team, based on each team member's area of expertise and practical experience. (Suggested roles to support each QAPP component are included in [Appendix B](#).) An appropriate team member should be assigned the responsibility of compiling the various sections of the QAPP, developing and overseeing document production, and implementing a quality review.

During Draft QAPP development, the project team will address three of the four common QAPP components identified in Figure 1: Data Generation and Acquisition; Assessment and Oversight; and Data Validation and Usability. Additional support in addressing each of these components of the QAPP can be obtained from the appropriate environmental contractor's subcontractors and the EPA and state QA representatives.

While the environmental contractor is typically relied upon to lead development of the QAPP, the cooperative agreement recipient remains responsible for the timely submission of a technically sound QAPP for EPA and state approval. This requires the recipient to actively communicate, coordinate and monitor the project team's progress. Brownfields cooperative agreement recipients may seek independent technical support to help guide the development of the QAPP from resources such as EPA's Technical Assistance to Brownfields (TAB) providers.

Step 3 Activities

- ✓ Assign Draft QAPP components completion
- ✓ Develop Data Acquisition and Management approach
- ✓ Identify appropriate Assessment and Oversight activities to ensure project quality
- ✓ Complete Data Validation and Usability components of the QAPP to describe how data will be evaluated before being used for decision-making
- ✓ As sections are completed, obtain team and decision-maker input to minimize issues that can arise during Steps 5 and 6

Brownfields cooperative agreement recipients may seek technical support for their projects from EPA's Technical Assistance to Brownfields (TAB) providers.

<https://www.epa.gov/brownfields/brownfields-technical-assistance-training-and-research#TAB>

Completion of many of the QAPP sections is dependent upon prior completion of the site assessment strategy and SAP design. Decisions about what media will be sampled (for example, air, soil, soil gas, groundwater, surface water, sediment, sludge, asbestos and lead paint), where samples will be collected and what analytical methods and detection levels will be used, will drive the design of other components of the QAPP. Effective and efficient development of the QAPP components, therefore, will require frequent interactions and clear communications between the environmental contractor project manager, the project scientist and engineer, the project chemist, and decision-makers closely involved in the project.

For example, analytical methods identified in the QAPP will likely require specific sampling methods (to ensure adequate sample material is collected) and sample handling approaches (to ensure proper sample preservation, holding times and shipping temperatures). Effective team communications will help ensure that the quality objectives and criteria previously derived as part of the SAP are reflected consistently throughout the QAPP. Therefore, the lead authors of each QAPP section should be encouraged to coordinate with the leads of other closely related sections. In addition, having QAPP development personnel maintain communication with Regional EPA and state personnel to obtain their input during development will save valuable time and cost.

Step 4 Activities

- ✓ Distribute the Draft QAPP for internal team review
- ✓ Discuss team input on the Draft QAPP
- ✓ Revise the Draft QAPP to address gaps, comments and inconsistencies, or changes identified through the review
- ✓ Prepare the revised Draft QAPP for submittal to EPA or state reviewers



Step 4: Review and Revise the QAPP

Review and revision are important steps to ensuring the QAPP meets the recipient's project needs and is ready for EPA and state review. A high-quality QAPP also increases the potential for securing EPA and state approval.

The review process typically starts with an internal technical review performed by senior environmental contractor personnel. In many contractor organizations, the document will also undergo an editorial review. The completed Draft QAPP is then submitted to the cooperative agreement recipient for review.

Upon receipt, the recipient distributes the document to its support personnel for review. The recipient compiles all reviewer edits and comments and provides them to the environmental contractor. The environmental contractor then revises the QAPP to respond to the recipient's review, seeking clarification where needed to ensure appropriate revisions are made. The draft Final QAPP is then submitted to the recipient, EPA, state and other stakeholders as directed.

Sometimes project teams may come under pressure to meet expedited deliverable deadlines or mobilize to the field; this can result in a compressed schedule for review. However, taking the time to thoroughly review the QAPP helps ensure that all components are complete and consistent. Review also helps avoid costly document revisions and schedule impacts during field efforts (if a

significant error was overlooked). For example, if the subcontractor laboratory provides the incorrect sample bottles or sample preservatives due to an error in the QAPP, the field team could work with the laboratory to obtain the correct sample containers and, as necessary, re-sample the site; however, this would increase shipping and labor costs and cause a delay that could have a significant impact on the project schedule and any dependent activities. A robust QAPP review helps to identify and address such potential issues before field work begins.



Step 5: Submit QAPP for EPA and State Approval

After all necessary reviews and revisions of the draft QAPP are complete, a draft Final version is submitted to the EPA and state Brownfields QA representatives for review and approval. It may also be necessary to submit the document to other state agencies and stakeholders who have partial approval authority or significant interest in the proposed future reuse of the brownfields site. If input is obtained from all important parties throughout the development process, the QAPP will likely meet QA officials' expectations and incur only minor comments or input. The cooperative agreement recipient and the environmental consultant then discuss any input received with the reviewers as needed, revise the QAPP to address reviewer input and submit the revised Final QAPP to obtain formal approval to initiate field work. The recipient should confirm with each reviewing party specific turnaround times for review and incorporate these into the overall project schedule.



Step 6: Implement, Monitor and Document Progress

After obtaining QAPP approval, the project team uses the QAPP to guide the Brownfields site assessment project. Some situations in the field may require intentional deviations from the QAPP, such deviations need to be carefully planned and documented along with any unexpected deviations. Significant deviations may warrant revising the site-specific QAPP or site-specific QAPP addendum. Discussions with Regional EPA and state counterparts will help the team identify when such actions are appropriate or necessary. Substantive revisions may require the recipient to repeat some or all of the process described in Steps 2 through 5.

Still Have Questions?

The best points of contact for further questions will be the recipient's Regional EPA Brownfields project officer and EPA and state QA representatives. These personnel can provide guidance and assistance in developing and implementing QAPPs for Brownfields programs and projects. Regional Brownfields Coordinators (<https://www.epa.gov/brownfields/brownfields-contacts-epa-regional-offices>) can also provide useful information and support. Convenient

Step 5 Activities

- ✓ Submit the draft Final QAPP for review
- ✓ Obtain EPA or state review input or approval
- ✓ Discuss any input with EPA or the state and revise, as necessary
- ✓ Submit the revised Final QAPP for approval, as necessary
- ✓ Ensure QAPP approval is obtained before site work begins

Step 6 Activities

- ✓ Distribute the approved Final QAPP to project team
- ✓ Support communication and monitor progress
- ✓ Discuss any deviations required and whether QAPP revision is warranted
- ✓ Obtain approval for any QAPP revisions
- ✓ Document QAPP implementation and project outcomes

access to the EPA's Regional QA technical resources webpages is provided below.

References

The following references provide additional information on the Brownfields Program, general QAPP development, EPA Regional QA and hiring contractors.

General Brownfields Program Information

EPA. 2017. Office of Superfund Remediation and Technology Innovation (OSRTI) Brownfields Road Map to Understanding Options for Site Investigation and Cleanup, Sixth Edition: EPA 542-R-17-003. November.
<https://www.epa.gov/brownfields/brownfields-road-map>

General Quality Assurance Project Plan Guidance

EPA. Office of Environmental Information (OEI) Quality Web Site:
www.epa.gov/QUALITY/qapps.html

EPA. 2008. OEI. U.S. Environmental Protection Agency Quality Policy. EPA Classification Number CIO 2106.0. CIO Transmittal Number 09-001. October.
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EPA. 2006. OEI. Guidance on Systematic Planning Using the Data Quality Objectives Process: EPA QA/G-4. EPA 240-B-06-001. February.
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Intergovernmental Data Quality Task Force (IDQTF). 2004. Uniform Federal Policy for Quality Assurance Project Plans. Evaluating, Assessing and Documenting Environmental Data Collection and Use Programs, Part 1, UFP-QAPP Manual, Final, Version 1, PA: EPA 505-B-04-900A. DoD: DTIC ADA 427785. July. <https://www.epa.gov/fedfac/uniform-federal-policy-quality-assurance-project-plans-evaluating-assessing-and-documenting>

Regional Quality Assurance Technical Resources Webpages

Region 1: <https://www.epa.gov/quality/managing-quality-environmental-data-epa-region-1>

Region 2: <https://www.epa.gov/quality/managing-quality-environmental-data-epa-region-2>

Region 3: <https://www.epa.gov/quality/about-managing-quality-environmental-data-epa-region-3>

Region 4: www.epa.gov/region4/sesd/sesdpub_guidance.html

Region 5: <https://www.epa.gov/quality/managing-quality-environmental-data-epa-region-5>

Region 6: <https://www.epa.gov/quality/managing-quality-environmental-data-epa-region-6>

Region 7: <https://www.epa.gov/quality/managing-quality-environmental-data-epa-region-7>

Region 8: <https://www.epa.gov/quality/managing-quality-environmental-data-epa-region-8>

Region 9: <https://www.epa.gov/quality/managing-quality-environmental-data-epa-region-9>

Region 10: <https://www.epa.gov/quality/managing-quality-environmental-data-epa-region-10>

Hiring Contractors and Integrating Streamline Investigation Concepts

EPA. 2005. OSWER. Understanding Procurement for Sampling and Analytical Services Under a Triad Approach. EPA 542-R-05-022. June. <https://www.epa.gov/remedytech/understanding-procurement-sampling-and-analytical-services-under-triad-approach>

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Notice and Disclaimer

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The Road Map provides introductory information rather than guidance and does not impose legally binding requirements, confer legal rights, impose legal obligations, implement any statutory or regulatory provisions, or change or substitute for any statutory or regulatory provisions. The EPA recommends users refer to applicable regulations, policies and guidance documents regarding development of QAPPs for Brownfields site assessment and cleanup projects.

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For region-specific questions regarding QAPPs, please refer to the information provided for each Region on pages 13-14 of this document.

Appendix A – General QAPP Completion Checklist

Recipients can use this checklist to keep track of their generic QAPP, site-specific QAPP and site-specific QAPP addendum development efforts.

Note: Recipients should confirm specific QAPP development requirements and processes with their Regional EPA and state Brownfields representatives.

Project

Name: _____ Location: _____

Recipient Organization

Name: _____ Date: _____

Recipient Project Manager

Name: _____ Telephone: _____ E-mail: _____

Recipient Quality Assurance Representative

Name: _____ Telephone: _____ E-mail: _____

EPA Brownfields Project Officer

Name: _____ Telephone: _____ E-mail: _____

EPA Quality Assurance Representative

Name: _____ Telephone: _____ E-mail: _____

State Brownfields Project Manager

Name: _____ Telephone: _____ E-mail: _____

State Quality Assurance Representative

Name: _____ Telephone: _____ E-mail: _____

Environmental Contractor Project Manager

Name: _____ Telephone: _____ E-mail: _____

Environmental Contractor Quality Assurance Manager

Name: _____ Telephone: _____ E-mail: _____



Prepare for QAPP Development Effort

I have reviewed the Brownfields Recipients' Road Map to Understanding Quality Assurance Project Plans and contacted the EPA Brownfields project officer to obtain appropriate QA representative contacts.

- I have contacted EPA and state Quality Assurance (QA) representatives to confirm the specific QA procedures and requirements for my location and to obtain their input on:
 - The appropriate QAPP scale and format for my Brownfields program and specific site(s).
 - Available training or resources (QAPP examples, QAPP templates, guidance, requirements, checklists and experts).
 - Guidance or suggestions on preparing a Request for Proposal (RFP) to obtain contractor and laboratory support.
 - Any special certifications or training that will be needed in our area and for my site work.
 - Any unique roles and responsibilities that must be included in QAPPs for Brownfields sites in my specific EPA region and state.
- I have reviewed the information provided to me by the EPA and state QA representatives and forwarded relevant information to other project participants for their use.



Step 1: Establish Project Team

- I have communicated with EPA, state and other representatives to seek their input on hiring an environmental contractor.
- I have developed and released an RFP according to my organization's requirements to solicit proposals for an environmental contractor to support my project.
- I have reviewed contractor proposals according to the terms and conditions of my Cooperative Agreement and my organization's requirements, interviewed the key personnel from the finalists and selected the preferred contractor.
- I have had a preliminary meeting with my EPA Brownfields project officer, my environmental contractor and the EPA and state QA representatives to discuss my program and site(s) and identify considerations relevant to the generic QAPP and site-specific QAPP addendum(s) for my site(s).
- The environmental contractor has developed a detailed project description that identifies defined tasks, schedules and personnel roles and responsibilities.



Step 2: Develop Data Quality Objectives and Decision Criteria

- The environmental contractor has developed and documented a process for conducting site assessments within the context of the Brownfields program for inclusion in the generic QAPP.
- The environmental contractor has reviewed existing site documentation, developed the conceptual site model (CSM) for the site and identified key data gaps for the site-specific QAPP or site-specific QAPP addendum.

- The environmental contractor has developed project and data quality objectives and decision criteria.
- I have worked with the environmental contractor and decision-makers to (1) refine a list of decisions to be made and (2) develop specific decision rules to guide our work.
- The project team has addressed special training and certification requirements.
- The project documentation and data deliverables that will be prepared and maintained (including consideration of program- or location-specific documentation requirements) have been identified for inclusion in the QAPP.
- I have obtained all required stakeholder and decision-maker input on the decision-dependent components of the QAPP.



Step 3: Develop Draft QAPP

- The environmental contractor has assigned all of the Draft QAPP components to the appropriate project team members, including the role of compiling each QAPP component into a single deliverable. Strong team communications and collaboration have been encouraged.
- A schedule for completing each element and the compiled Draft QAPP has been established.
- The project team has addressed the Data and Acquisition and Management section of the Draft QAPP, including the site assessment approach and field sampling plan design.
- The project team has addressed the assessment and oversight section of the Draft QAPP, including identification of activities to be implemented to ensure quality.
- The project team has addressed the Data Validation and Usability section of the Draft QAPP, including identification of activities to be implemented to ensure that the data obtained are of adequate quantity and acceptable quality to support site decision-making.



Step 4: Review and Revise the QAPP

- The environmental contractor has performed internal technical review of the Draft QAPP, performed needed revisions and submitted a final version to me for review.
- I have distributed the Draft QAPP to other personnel in my organization for review, as applicable.
- I have obtained internal team input on the Draft QAPP and provided a combined set of edits and comments to the environmental contractor.

- I have met with the environmental contractor to clarify any questions on my organization's edits and comments. We discussed the best way to address the reviewer input and I directed the contractor to proceed with revising the QAPP.
- The environmental contractor has revised the Draft QAPP to address gaps, inconsistencies or other changes identified through my organization's review and finalized it for EPA and state review.



Step 5: Submit QAPP for EPA or State Approval

- I have submitted the Draft QAPP to the appropriate EPA and state reviewers, as well as other state agencies and stakeholders who must approve it before any field activities can be initiated.
- As necessary, meetings have been held with QA representatives and the project team to discuss input, identify necessary actions to address input and enable submission of the draft Final QAPP.
- As necessary, the draft Final QAPP has been revised.
- As necessary, I have submitted the revised Final QAPP to the EPA and the state for approval.
- I have obtained approval on the Final QAPP from appropriate EPA and state representatives.



Step 6: Implement, Monitor and Document Progress

- I have provided a copy of the QAPP to all project team members and have advised them that any deviations from the QAPP must be documented and reported according to provisions in the QAPP.
- I have communicated with EPA and state representatives any deviations from the QAPP to determine whether they warrant a QAPP revision or can be documented for inclusion in project reporting.
- I have obtained approval for any QAPP revisions, if necessary.
- The project team has prepared the site assessment report that presents the results of all of the data verification and validation activities described in the QAPP. The report also includes key findings, conclusions and recommendations for any subsequent site assessment or cleanup efforts.
- I have ensured that the project team followed the QAPP and overseen documentation of QAPP implementation and project findings. Deviations from the QAPP have been documented and shared with the EPA Brownfields Project Officer.
- I have monitored progress and communicated regularly with the project team, decision-makers and other stakeholders.
- We have used the site data and QAPP implementation to support sound decision-making at the site.

Appendix B – Technical Components for a Generic QAPP and Site-Specific QAPP Addendum, or Site-Specific QAPP

Component / Subcomponent	Description
A. PROJECT MANAGEMENT	Contains elements that describe key team members, roles and responsibilities, site background, the problem to be addressed and other information related to project management and communication.
A1. Title and Approval Sheet	Provides the title of the project and specifies whether the document is a generic QAPP, site-specific QAPP or a site-specific QAPP addendum. Includes the signatures of all key team members and decision-makers whose approvals are needed to document approval and agreement that the environmental data will be collected in an appropriate manner.
A2. Table of Contents	Demonstrates that all of the QAPP components are addressed and specifies where in the QAPP each is located. If required, a document control format may be used, starting on the Table of Contents.
A3. Distribution List	Lists all persons who will need to review or use the QAPP.
A4. Project/Task Organization	Provides an organization chart that shows the integrated roles, reporting structure and lines of communication for project team personnel.
A5. Conceptual Site Model (CSM)	Describes and presents what is known, suspected and unknown about the brownfields site. Provides the foundation for identifying site data gaps that form the basis for questions that need to be answered by site assessment efforts. May be in written, graphical or electronic format (such as maps or 3-dimensional visualizations).
A6. Project Description	Describes the general approach that will be used to address the data gaps identified during CSM-based project planning. Also describes the main tasks and schedule that will be implemented to complete the project. For example, it addresses tasks such as obtaining site access, clearing utility locations before performing intrusive activities, collecting and analyzing samples, reviewing and interpreting analytical and other site measurement results and preparing project reports. Also includes maps or tables to show geographic locations of field tasks.
A7. Data Quality Objectives and Criteria	Uses the information provided by the CSM evaluation and identified data gaps to construct one or more concise “if-then” statements that describe how the data collected will be used to support site decision-making. Includes a description of how data will be evaluated for appropriate use in accordance with precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS) parameters.
A8. Special Training/ Certification	Provides an overview of any special training or certification required to collect the environmental data and plans for providing, documenting and assuring this training. Requires compliance with any state-required certifications for the organizations involved in collection and reporting of the environmental data. In addition, it may address any special training that might be required for proper operation and maintenance (O&M) of the equipment to be used at the site.
A9. Documents and Records	Describes the general contents and formats of all the documents and records that will be prepared for the project. Also includes the process for distribution of documents and length of retention. In some cases, the necessary documents may be largely dictated by the cleanup program (for example, voluntary state cleanup program) that will be used as the basis for designing and implementing site assessment and cleanup.

Component / Subcomponent	Description
B. DATA ACQUISITION and MANAGEMENT	Describes how and where field measurement data will be acquired and how samples of each environmental media and analyte classification will be collected, transported, analyzed and recorded.
B1. Sampling Process Design	Describes sampling locations and nomenclature for identification, the environmental media to be sampled (for example, soil, groundwater surface water and sediment) and the types of chemicals that will be analyzed for in each sample to support project and site decision-making. Explains rationale for the research experimental design.
B2. Sampling Methods	Lists all sampling methods that will be used to collect samples; for example, soil and groundwater sampling equipment, the types of containers to be used for each media's samples and sample preservation methods. Describes corrective action measures if problems arise.
B3. Sample Handling and Custody	Describes how each type of sample container will be labeled, confirms whether labeling will occur before crews mobilize to the field or in the field and defines how each sample will be prepared for transport, transported to the laboratory and stored by laboratory personnel. Describes sample chain-of-custody procedures.
B4. Analytical Methods	Specifies the analytical methods and performance requirements to be used based on the chemicals to be analyzed and the associated media (air, soil, soil gas, groundwater, surface water, sediment and sludge). Provides reference to the laboratory's Quality Management Plan (QMP), a standard requirement for any QAPP which requires laboratory analytical services.
B5. Quality Control	Describes the number and types of quality control samples to be collected and analyzed at the site, for example field and trip blanks, sample splits and duplicates; and matrix spikes/matrix spike duplicates. Describes corrective action measures if problems arise.
B6. Instrument/ Equipment Testing, Inspection and Maintenance	Describes how the major field sampling and laboratory equipment proposed for the site will be tested, inspected and maintained in a manner to ensure data generated achieve the specified levels of quality.
B7. Instrument/ Equipment Calibration and Frequency	Describes how the major field sampling and laboratory equipment proposed for the site will be properly calibrated at manufacturer's specified frequencies to ensure high-quality data.
B8. Inspection/ Acceptance of Supplies and Consumables	Describes how consumables and supplies (such as tubing for collecting water samples or plastic pipette nozzles in the laboratory) will be inspected and accepted before use to ensure that subgrade materials do not compromise the quality of the samples or analytical results.
B9. Non-direct Measurements	Specifies the sources of data and information that will be collected from the literature or from state or local organizations, how these data will be used in the decisions to be made and how those data will be reviewed and accepted to ensure they are of a quality consistent with their intended uses.
B10. Data Management	Describes how all data will be managed. For example, it describes how field logbooks will be maintained, how the laboratory will record the results of each analysis and how the laboratory will use these records to prepare and present data to the project manager. It describes the project database software, if applicable, and provides information on data entry, storage and exporting. Also describes the formats for providing each type of data to be produced by the project.

Component / Subcomponent	Description
C. ASSESSMENT AND OVERSIGHT	Describes the types and frequencies of quality assessments that the project team will conduct to ensure that project quality goals are being met.
C1. Assessment and Response Actions	Describes assessment, schedule and response actions that will be taken when necessary. For example, an assessment activity might include a daily review of results from quality control laboratory blank samples by the laboratory PM; an associated response action may involve reanalysis of the samples from any batch where the laboratory blank exceeded a specified concentration.
C2. Reports to Management	Provides the format, frequency and contents of any planned reports to management based on the response actions described in C1. It also addresses who will receive and act on the information.
D. DATA VALIDATION AND USABILITY	Describes how data will be evaluated to determine their validity and usability to support decision-making process for the site.
D1. Data Review, Verification and Validation	Specifies the process and criteria that will be used to determine whether or not all of the types and quantities of data specified in the QAPP were actually collected (verification) and to compare the data that were collected to the quality control criteria that are specified in the QAPP (validation).
D2. Validation and Verification Methods	Describes criteria for annotating data from each batch of samples based on the analytical results for the quality control samples and instrument calibration requirements. Describes who will conduct data validation, which involves summarizing and describing the numbers and types of data annotations that were assigned to various data. Also describes what percentage of the data will be validated, what level of data validation criteria will be used and how various levels of non-conformance or conformance will be documented. Discusses how issues will be resolved.
D3. Reconciliation with User Requirements	Provides a guide for checking the quality of data obtained against the quality requirements for decision-making and results in statements on whether the data collected and results derived will allow the stakeholders to make the required project and site decisions. Discusses how issues will be resolved.

Note: The above components and subcomponents are subject to change as a function of any future revisions to EPA QAPP guidance. More detail can be found in the Guidance for Quality Assurance Project Plans: EPA QA/G-5 and Requirements for Quality Assurance Project Plans: EPA QA/R-5 in the [References section](#). In addition, EPA and state requirements should be checked for location-specific requirements that may impact QAPP contact.