

EPA-NEW ENGLAND, REGION I

Planning and Documenting Brownfields Projects

Generic Quality Assurance Project Plans, and Site-specific QAPP Addenda



**U.S. EPA-NEW ENGLAND
Region I**

**Brownfields Section
Office of Site Remediation and Restoration**

**Quality Assurance Unit
Office of Environmental Measurement and Evaluation**

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Planning and Documenting Brownfields Projects

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Brownfields Quality Assurance Project Plans Overview and Concepts

1.0 Introduction

The Environmental Protection Agency (EPA) requires that a Quality Assurance Project Plan (QAPP) be prepared to support all federally funded environmental projects involving the collection and use of environmental data. For EPA's Brownfields grant program, this requirement means that whenever environmental samples are being collected as part of a site assessment or cleanup project, a QAPP must be prepared and approved by EPA before site work begins.

EPA realizes that it takes significant time, effort and money to plan a successful project and capture it in a QAPP. With this in mind, EPA New England (EPA NE) has designed a regional Brownfields QAPP Program to help guide the QAPP development process, and streamline the documentation process needed for future projects. The purpose of this document is to provide an overview of the QAPP program, and to help both the Brownfields grantee and the environmental consulting firm understand what is required and expected.

2.0 What is a QAPP?

A QAPP is a document that captures how and why a project will be conducted, and assures the quality of the data for making environmental decisions. A QAPP can be broken down into three parts: the project plan, the quality assurance steps performed to support that plan, and the Standard Operating Procedures for the collection and analysis of the samples.

2.1 The Project Plan

First and foremost, the QAPP is the plan for the project. It lays out the background behind the environmental problem, the objectives for the project, the tasks to be performed, and the design concepts behind the layout of the sampling locations.

A well thought out and documented plan is one of the biggest keys to a successful project. Also, by clarifying the problem, the project objectives and the design concepts for how and why the work is being performed, the plan preparer is establishing a documented line of thought for what the project is intended to accomplish. This planning step is critical to any project, and the document serves as a conduit for the participating organizations to reach agreement on the plan going forward. In addition, the QAPP can provide valuable insight and information to future organizations wishing to use the data.

2.2 The Quality Assurance Steps to Support the Plan

The second QA component to a QAPP involves integrating a series of checkpoints into the plan to monitor the work being performed and the data that is collected. These include:

- Project Oversight and Communication: Implementing a project takes teamwork. The QAPP documents check points where project leaders take an active role in overseeing certain parts

of a project to 1) see that work is being performed according to plan, 2) help catch and solve potential problems, and 3) see that effective communication is being used and appropriate information is being recorded and disseminated.

- Quality Control (QC) Samples: QC samples are integrated into the field sampling and analytical programs to help evaluate the quality of the data being generated. The QAPP specifies the types of QC samples that will be included and the acceptance criteria that will be used in evaluating the data.
- Data Checks during Collection, Manipulation, and Presentation: Many different types of information and data are collected during a project. The QAPP documents check points throughout the project where the information and data are collected, organized and reviewed for completeness, consistency and errors. These steps are critical for insuring that all the information and data is available, correct, and ready for the final data evaluation process.
- Data Evaluation Process: The QAPP documents the standardized process that will be used for the final review of the field data, laboratory data and the completed project as a whole. This final step evaluates whether there are any problems or limitations in the way the data should be used or interpreted in making decisions. It also analyzes the entire data set for any trends, anomalies, or gaps in the data and assesses their impact on the project. This data review forms the foundation on which the final conclusions and recommendations are based. These conclusions range from the need for additional data to estimating cleanup costs.

2.3 Standard Operating Procedures

The third QA component of a QAPP is Standard Operating Procedures (SOPs). These SOPs document the steps that are followed in collecting and analyzing environmental samples. By establishing a set of defined procedures, a level of uniformity and consistency is established in the work being performed. This standardization helps minimize variability in the data and establishes a level of quality in the work being performed.

SOPs that are current and well written are representative of a professional organization that is actively seeking to improve the quality of the work they perform. SOPs can be used as a teaching tool, an information tool, an assessment tool, and a tool for troubleshooting problems that may arise. In essence, better SOPs will lead to better consistency, which in turn will produce higher quality products.

3.0 EPA NE QAPP Program Overview

The EPA NE Brownfields QAPP program tries to take a practical approach to managing these three quality assurance components that must be a part of every QAPP. The result comes in the form of two planning documents that will be used together in the Brownfields program: the Generic (or Master) QAPP and the site-specific QAPP Addendum to meet the EPA QAPP requirements. In some cases, a traditional project QAPP may be the most efficient way to meet the requirements. However, for most sites, the two document approach will be most cost effective and result in quicker approvals.

The basic concept is to separate the process pieces of a QAPP (i.e., sections 2.2 and 2.3 above), and develop them into a Generic QAPP consisting of all the routine processes and procedures that will be used in performing every Brownfields project. This plan will set the foundation on which all the site-specific QAPP Addenda will be linked.

Site-specific QAPP Addenda are the project plans for the site assessment or cleanup work to be performed at a particular site (i.e., section 2.1 above). There will be two concepts for working with QAPP Addenda on a site, the initial QAPP Addendum, and any follow-up QAPP Addenda. The initial QAPP Addendum is the first and most comprehensive plan for the site. Follow-up QAPP Addenda are used to document any additional work that may be needed to complete the investigation or cleanup.

Once a Generic QAPP is developed by the environmental consulting firm, and approved by EPA, it will have a 5-year shelf life with an annual review and update. With the Generic QAPP in place, the environmental consulting firm can focus on planning the individual projects and maximizing the amount of sample data that can be collected with the available funds. As always, the ultimate goal is to obtain sufficient data to make sound environmental decisions for redevelopment.

The other big advantage of a Generic QAPP is that it can be applied to multiple sites under a single assessment grant, and can also be used on multiple Brownfields assessment and cleanup grants.

Sections 6.0 and 7.0 provide a more detailed overview on the processes for managing Generic QAPPs and site-specific QAPP Addenda, and Appendix A and B go into detail on the concepts for the information that should be included in each section of those documents, respectively.

4.0 Where QAPPs fit in the Brownfields Grant Process

Figure 1, on the following page, shows an overview of the major tasks performed during a Brownfields assessment or cleanup grant.

In the case of an assessment grant, the QAPP plays a significant role in delineating the extent of contamination on a site so cleanup planning can begin.

In a cleanup grant, the QAPP shares its role with the comprehensive remediation plan for cleanup and redevelopment of the site. In fact, if the cleanup plan does not call for the collection confirmatory samples (which verify the cleanup against state regulatory standards), the role of the QAPP may become even less, and in certain cases may not be needed. In general, however, most cleanup plans incorporate some form of environmental data collection which would trigger a QAPP. This might include such things as screening or testing soil during and after excavation, characterizing contaminated soil for purposes of disposal, or post cleanup monitoring.

With a Generic QAPP in place, the environmental consulting firm has the flexibility to incorporate the cleanup sampling directly into the remediation plan to streamline the

documentation process (i.e., incorporate the QAPP Addendum into the remediation plan to avoid having to manage two separate planning documents).

Assessment Grant Overview

- Solicit and hire an environmental consultant.
- Have the consultant submit an EPA approved **Generic QAPP** in preparation for site investigation work.
- Inventory and select a Brownfields site with the highest potential for redevelopment.
- Work with EPA to determine site eligibility (or with the state for petroleum sites).
- Have the consultant prepare a Phase I report on the site according to EPA's All Appropriate Inquiry rule or the ASTM E1527-05 Environmental Site Assessment Standard.
- Have the consultant prepare an **initial site-specific QAPP Addendum** to begin the Phase II investigation on the eligible property.
- As needed, have the consultant prepare **follow-up site-specific QAPP Addenda** to fully delineate the extent of contamination on the property and complete the Phase II investigation. The goal is to obtain sufficient environmental data to be able to begin cleanup planning.
- Begin evaluating cleanup options for the property, and prepare appropriate state required cleanup plans. Throughout the investigation it is important to establish the reuse and redevelopment plans for the property. Understanding where the buildings, pavement and open space will go on the property is a critical element in designing the cleanup strategy.
- Select another Brownfields property for investigation and redevelopment.

Cleanup Grant Overview

- Solicit and hire an environmental consultant.
- Enter the site into the state's voluntary cleanup program.
- Prepare a Community Relations Plan for the project.
- Have the consultant prepare an Analysis of Brownfields Cleanup Alternatives document to select a cleanup approach for the property.
- Have the consultant prepare the state-required remedial action plan.
- Have the consultant submit an EPA approved **Generic QAPP** and prepare a **site-specific QAPP Addendum** for cleanup. (The cleanup alternatives and site-specific QAPP Addendum may be combined with the remediation plan to streamline the documentation required for site cleanup.)
- Hold a public meeting to review the cleanup alternatives and remediation plan for the site and seek input and comments.
- Have the consultant finalize the remediation plan.
- Submit the cleanup budget for EPA approval.
- Have the consultant perform the cleanup according to the plans.
- Have the consultant prepare a final report and closeout documentation of the cleanup.

Figure 1 – Brownfields Assessment and Cleanup Grant Process

4.1 Hiring Quality Contractors

As Figure 1 demonstrates, hiring a quality environmental consulting firm is a very important first step in the grant process. The consultant will be doing a significant amount of the work under the grant, so the grantee needs to select a competent, qualified professional firm they feel comfortable with, and whose experience can help them attain their redevelopment planning goals.

The grantee's ability to select an environmental consultant with a knowledge and understanding of the grant process, its terms and conditions, and the state's environmental rules and regulations is one component to effectively and efficiently handling the Brownfields QAPP Program. The other component is the environmental consulting firm's ability to team up with an environmental laboratory (or laboratories) that can meet their needs and assist them with the QAPP process. Below are some QAPP related factors to consider in their selection.

Environmental Consulting Firms:

- Does the firm demonstrate a thorough knowledge of the state's environmental rules and regulations, and the process and documentation needed to take a property through site investigation, redevelopment planning, and cleanup for reuse?
- Does the firm demonstrate an established working relationship with the state's Brownfields Program and know the appropriate contacts within the program?
- Does the firm demonstrate knowledge of the Brownfields laws, EPA's All Appropriate Inquiries rule, and the cooperative agreement process and its terms and conditions?
- Does the firm understand EPA New England's Brownfields QAPP program and how to efficiently manage the QAPP process?
- Can the firm provide a Generic QAPP, with all the associated field and analytical SOPs, in electronic and hardcopy formats? Does the firm understand the site-specific QAPP Addendum process?
- Can the firm describe how they ensure the quality of the work they perform?

Environmental Laboratory:

- Does the laboratory demonstrate a thorough knowledge of the state's environmental standards and criteria that will need to be met in the analyses they perform?
- Is the laboratory customer service oriented and demonstrate the ability to help with project planning, resolve problems that may arise and meet requested turnaround times?
- Does the laboratory have the ability to provide electronic and/or paper copies of all their analytical SOPs, and the method detection limits and reporting limits for the environmental analyses the consultant will be requesting?
- Does the laboratory demonstrate the ability to provide a report deliverable that meets the state's requirements and EPA's Brownfields QAPP Program?

5.0 Project Organization

Figure 2 shows a typical layout of the project organization for a Brownfields site assessment or cleanup grant.

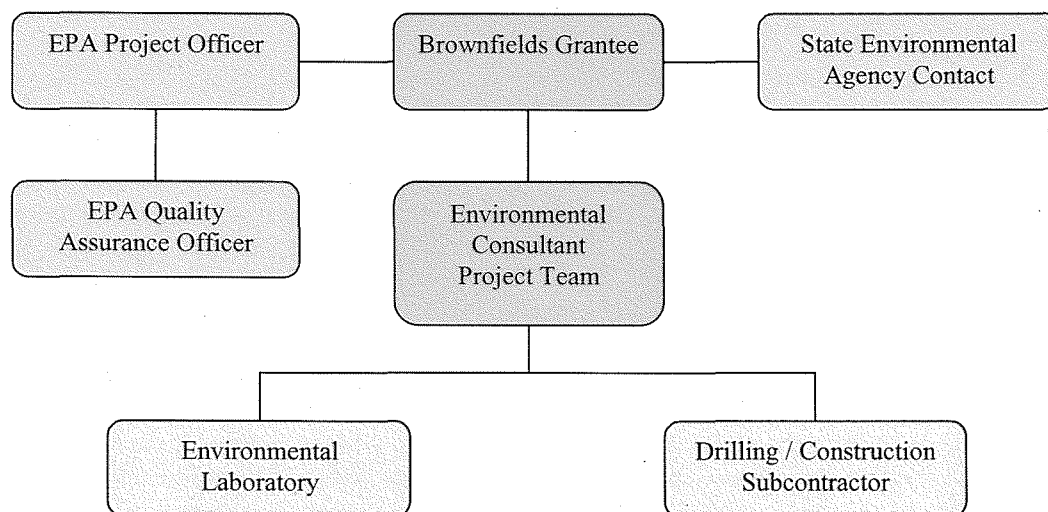


Figure 2 – Typical Brownfields Project Organization

Good communication and an understanding of each team member's role are important to both the success of the project and the grant. It is important to understand that the State and EPA have some distinct differences in their role in a Brownfields project.

- The State Environmental Agency has the lead regulatory role in any Brownfields site investigation or cleanup. The site assessment and cleanup of a Brownfields property must conform to the state's procedures, and meet all their appropriate rules and regulations. Although their environmental goals are the same, each state's program, their rules and regulations, and their level of involvement in a project will be different. The EPA Project Officer and environmental consultant can assist the grantee in understanding the state's role in their Brownfields projects, and establish a state contact, as appropriate.
- The EPA Project Officer has the responsibility to oversee and monitor the grant. As part of that responsibility, he or she must ensure the processes described in Figure 1 are followed and the terms and conditions of the grant are met. As Figure 1 shows, there is a sequence for conducting a site assessment or site cleanup. It is very important for the grantee and their environmental consultant to work together with EPA to ensure that this sequence is followed, and good communication is maintained amongst the project team. In certain cases, there is a serious risk that funding could be denied if key tasks are overstepped or performed without proper approval.

- The EPA Quality Assurance Officer provides a technical assistance role to the EPA Project Officer working on Brownfields sites. Their primary role in site work is to provide technical reviews of the Generic QAPPs and site-specific QAPP Addenda that are generated. All Generic QAPPs and initial site-specific QAPP Addenda are sent to the Technical Assistance Lead at EPA's Quality Assurance Unit, where an EPA QA Officer is assigned to the project and a Request for Assistance (RFA) tracking number is assigned to the QAPP. The assigned QA Officer will then remain on that project (reviewing all follow-up QAPP Addenda) until it is completed. The flow charts in Sections 6.4 and 7.2 illustrate the technical review and approval process for Generic Brownfields QAPPs and site-specific QAPP Addenda, respectively. In addition to QAPP reviews, the EPA QA Officer may also provide technical reviews of reports, and assessments and oversight of project work performed in the field.

5.1 Project Team Communication

Communicating as a team is so important to the success of an individual project, particularly as schedules become tight. The effective use of meetings, conference calls, and email will all play an important role in communicating, planning, and disseminating information on a project.

Because of the distance between project team members, email will generally play the most significant role in project communication. When sending email, it is important to maintain an all inclusive approach to copying the complete project team on site activities (i.e., EPA, the grantee, the lead consultant, and the state). The organizational chart in Figure 2 recognizes the formal flow of communication between the Brownfields project team. To effectively move a project along, and in the spirit of team work, these formal lines of communication can often become blurred. This is natural, and not necessarily something that should be avoided. The important thing is to recognize each team member's line of reporting, and their individual roles and responsibilities. Often times, by directing the flow of email communication along the formal path, and copying the complete project team on the correspondence, you can maintain that line of reporting while keeping everyone up to date and informed. Keeping everyone on the same page is a key to maintaining forward momentum on a project and catching problems before they develop.

The proper distribution of all project related documents and data is also another important part of project team communication. In general, all outputs generated with grant funds are to be distributed to the project team. The grantee and their environmental consultant should work with their EPA Project Officer and state project manager to understand the documents and records that need to be maintained and distributed under the grant.

6.0 Managing a Generic QAPP

Generic QAPPs are valid for 5-years from the signed approval date, and are to be updated annually. During the life span of a Generic QAPP, it must be continually managed as improvements are made and new work drives changes and additions to the document. The annual update is in place as a management tool to capture the accumulated changes over the past year, and to incorporate them into the master document. To continue site work beyond the 5-year period, the Generic QAPP should be thoroughly reviewed and updated to reflect the organization's current practices, and must then resubmitted to EPA for re-approval.

In some ways, a Generic QAPP can be thought of as a library of information. As more books and information are added, the resources of that library grows, and the greater the ability of that institution to handle a variety of applications. In the same sense that a library is a living and growing institution, a Generic QAPP is a living and growing document. Thus, it is very important that systems be developed during the initial construction of the Generic QAPP so the document can be effectively managed and distributed over time.

When an environmental consulting firm is selected to work on their first new Brownfields grant, they will need to submit a Generic QAPP for review and approval by EPA. Once the Generic QAPP is approved, the environmental consultant can begin site work under that grant, and begin preparing site-specific QAPP Addenda. When the firm is then selected to work on another grant, they will simply need to provide the new grantee with a copy of their approved Generic QAPP, and they can begin site-specific work immediately. As a consulting firm gains business on multiple Brownfields grants, they will need to refine their management system (and the annual update process) to ensure that each grantee has the most complete and up to date version of the Generic QAPP.

6.1 Initial Planning for the Generic QAPP

In planning a management system for the Generic QAPP, the environmental consulting firm must understand a couple of preliminary points. First, each Brownfields grant is considered a separate entity, so each grant will require a copy of the Generic QAPP. Thus, the system must be designed so the document can be easily copied and distributed. Second, since site work will be performed in accordance with state rules and regulations, the Generic QAPP will effectively be designed as a state-specific document.

A Generic QAPP may be designed to operate in multiple states. However, this will be a more complex document and will require a more experienced management system to operate smoothly. It is generally recommended that an environmental consulting firm develop their first Generic QAPP for a single state. This will allow the firm to establish and refine their management system as employees gain more experience. Since a Generic QAPP is flexible by nature, adapting the document for work in another state can always be done later on, and having an already established system in place may make this task easier to accomplish.

State standards and criteria for air, water and soil will drive environmental assessment and cleanup under the grant. During the initial planning stages of developing a Generic QAPP, the environmental consulting firm should partner with a quality environmental laboratory that can meet these standards. The consulting firm should work with this laboratory to obtain their SOPs for the basic routine analyses they will be requesting, and establish an agreed upon laboratory report deliverable that will meet the needs of the state and EPA's Brownfields Program. Additional laboratories can be included in the Generic QAPP, but again, this will require development of a more complex management system to handle this flexibility. Generally, it is always good to start small, get the plan up and running, and then add new methods and laboratories over time as the work requires.

6.2 Generic QAPP Construction

A Generic QAPP will be composed of two parts, the main body to the document and an appendix containing the field and analytical SOPs. This separation will allow for independent modification of the two parts, and will also help with electronic submission of the SOPs via CD. (The use of electronic and hardcopy submissions are addressed further in Section 6.4.)

Figure 3 shows a breakdown of all the QAPP elements that need be covered in the main body of a Generic Brownfields QAPP. The QAPP elements in bold are considered the primary elements required in a site-specific QAPP Addenda. This section will highlight some of the initial design concepts for how these elements relate in the Generic QAPP, while Appendix A and B will go into the actual information that goes into each of these elements.

Brownfields Generic QAPP Template			
Project Management		Measurement Data Acquisition	
Section A	Title and Approval Page/Intro	Section E	Sampling Design and Site Figures
Section B	Project Organization	Section F	Sampling & Analytical Method Requirements
Section C	Problem Definition	Section G	Methods & SOP Reference Table
Section D	Project Description/timeline	Section H	Field Equipment Calibration & Corrective Action
		Section I	Lab Equipment Calibration & Corrective Action
		Section J	Sample Custody & Handling Requirements
		Section K	Analytical Sensitivity and Project Criteria
		Section L	Field Quality Control Requirements
		Section M	Laboratory Quality Control Requirements
		Section N	Data Management & Documentation
Assessment/Oversight		Data Evaluation	
Section O	Assessments & Response	Section Q	Field Data Evaluation
Section P	Actions	Section R	Laboratory Data Evaluation
	Project Reports	Section S	Data Usability and Project Evaluation

Figure 3 – Brownfields QAPP Elements

- **Section A - Title and Approval Page / Introduction:** A Title and Approval Page is needed for every Generic QAPP and every site-specific QAPP Addendum. In both cases, a brief introduction will follow the Title and Approval Page. The introduction will set the stage for the document that follows and place it in context to the Brownfields program and the grantee. As part of the introduction to the Generic QAPP, the reader will be informed as to the state-specific nature of the plan's design. Appendix A and B provide additional detail on the information to be included in these introductions. As a last part to Section A, the Generic QAPP should include a Table of Contents detailing the sections of the QAPP and all the attached appendices.
- **Section B – Project Organization:** As mentioned earlier, an approved Brownfields Generic QAPP can be used on multiple Brownfields assessment or cleanup grants. With each grant, the project organization and area covered by the grant will be different. Thus, the complete project organization will not be known until the Generic QAPP is submitted for work on a particular grant. To permit versatility in the review, approval and distribution process, the

project organization in the Generic QAPP will be set up as a template that contains relevant information on the lead environmental consulting firm and their known subcontractors. Place holders should be kept open for the remaining grant-specific personnel. Figure 2, in Section 5.0, presents an example of the basic organizational chart that would routinely be used on a Brownfields project.

When a consulting firm begins work on a Brownfields grant, they will need to submit a copy of their approved Generic QAPP. In addition, an updated Project Organization chart, containing all relevant personnel on the project team, should be provided along with a brief cover letter that assigns the Generic QAPP to the particular grant (including the type of Brownfields grant and the EPA Grant number), and provides some relevant background information on the grantee and the geographic area covered by the grant.

- Sections C, D & E - Problem Definition, Project Objectives, and Sampling Design & Site Figures: These sections should be provided in the Generic QAPP, but simply state that the relevant project information will be provided in the site-specific QAPP Addendum.
- Section F – Sampling and Analytical Methods requirements: In the site-specific QAPP Addendum this section will contain a detailed summary table of the samples being collected and the analyses being performed. In the Generic QAPP this section will include a template of this table which includes all the pre-established analytical information for the routine methods and matrices covered in the QAPP (i.e., everything but the sample numbers and SOP references).
- Sections G through S: These Sections make up the heart of the Generic QAPP. When putting these sections together, the general guideline is to use concise language that describes the firm's individual processes, and include the QC checks used to monitor that processes.

NOTE: Many of these QAPP elements are linked together in some manner. Appendix A offers some valuable insight into how the Generic QAPP fit together and will help the writer organize the QAPP better and minimize any redundancy.

- Laboratory information: The environmental consulting firm will need to work closely with the laboratory (or laboratories) to obtain needed information for the Generic QAPP. The following items will be required:
 - SOPs for the preparation and analysis of environmental samples. The consultant will need to prepare a catalog of laboratory SOPs for the Appendix to the Generic QAPP. Obtaining electronic copies of the SOPs will be essential for ease of management and distribution of the generic QAPP.
 - The consultant will need to prepare an SOP reference table in Section G and develop and maintain a reference numbering system for the SOPs (SOP references will need to be provided in Section F of the QAPP Addendum). The SOP reference numbering system should be designed with the anticipation of multiple laboratories being added to the plan.

- The consultant will need to obtain the Method Detection Limits and Reporting Limits for each analytical method and present them along with the numeric state criteria in Section K (Analytical Sensitivity and Project Criteria).
- The consultant will need to work with the lab to obtain a data package deliverable that meets the contents and QC requirements of the state and EPA's Brownfields Program and present that information in Section N (Data Management and Documentation).
- For each analytical method, the consultant will need to obtain the laboratory's acceptance criteria for the QC sample results that will be provided in the laboratory data package, and present that in Section M (Laboratory Quality Control Requirements).

Remember, whenever a site-specific investigation or cleanup requires the addition of a new analytical method, the new SOP, along with the relevant information to the above Sections, will need to be included in the associated site-specific QAPP Addendum. This information should be tracked and incorporated into the Generic QAPP at the yearly update.

6.4 Generic QAPP Review, Approval and Distribution Process

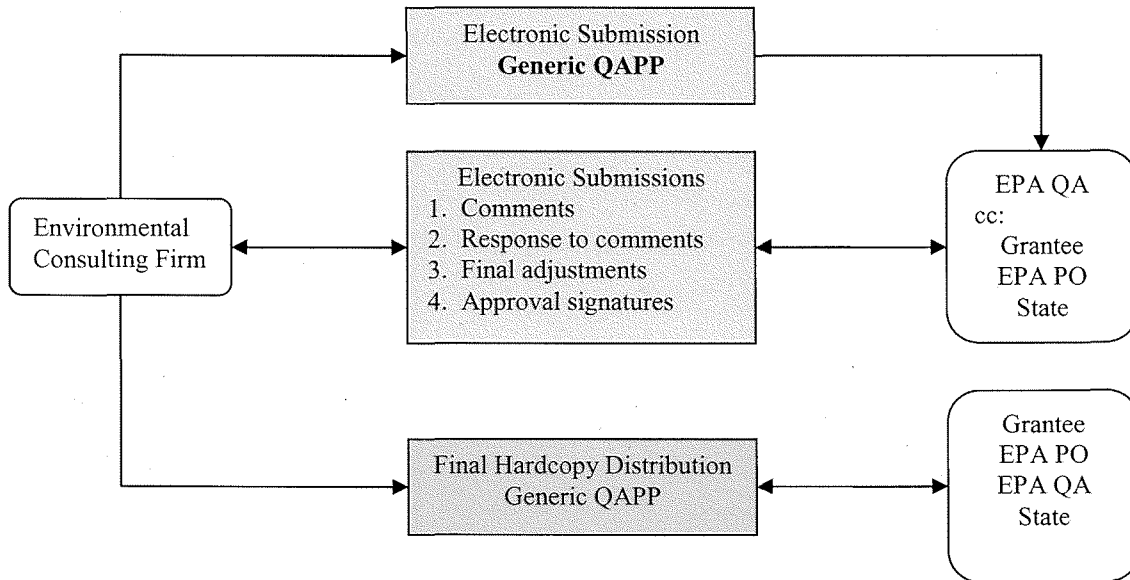
Figure 4 shows a flowchart diagram of the review, approval and distribution process for the Generic QAPP. Please note, hardcopies of the main body of the Generic QAPP should not to be submitted until the review and approval process is completed. The consultant should submit an electronic copy of the document, the review and comment process should progress through email and telephone communication. Final approval of the Generic QAPP should be done through electronic signatures (see section 8.0 for further details).

The EPA Quality Assurance Unit will maintain a hardcopy catalog of all the SOPs provided in the Appendix to the consultant's Generic QAPP. Final distribution of the SOP appendix should be in electronic format on a CD. NOTE: SOPs distributed on CDs must be indexed properly for ease of review and printing of individual SOPs. Combining 15 SOPs into a 200 page file is unacceptable.

Remember, when submitting an EPA approved Generic QAPP for work on a Brownfields grant, it must be accompanied by an introductory cover letter and an updated organizational chart.

NOTE: EPA reserves the right to address missing information, or significant issues that were missed, in a previously EPA approved Generic QAPP.

Generic QAPP Main Body



Generic QAPP SOPs

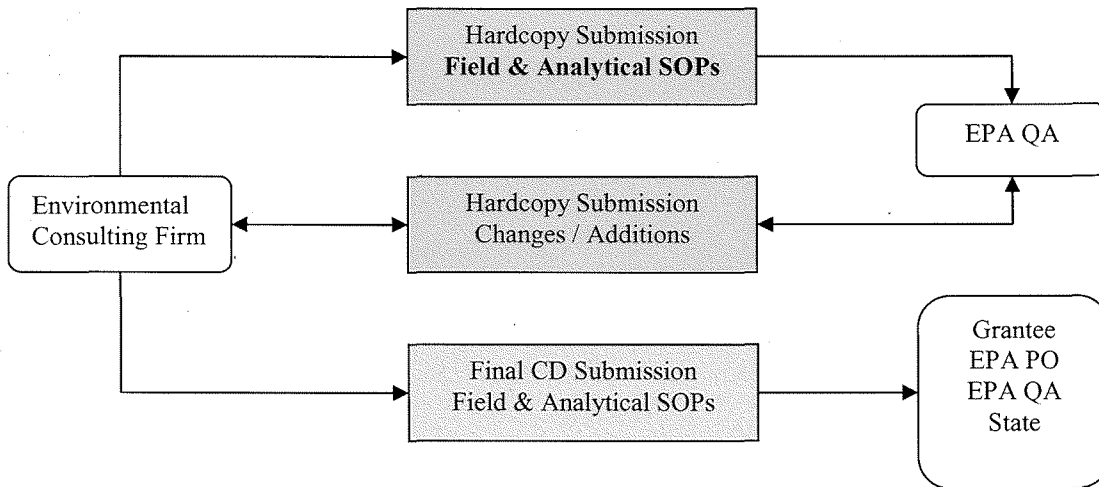


Figure 4 – Generic QAPP Review, Approval and Distribution

7.0 Managing Site-Specific QAPP Addenda

Site-specific QAPP Addenda are the detailed project plans for environmental work conducted under a Brownfields grant. As mentioned earlier, there are two types of site-specific QAPP Addenda associated with a particular site investigation or cleanup, the initial site-specific QAPP Addendum and any follow-up QAPP Addenda for additional work at the site.

The initial site-specific QAPP Addendum is the first investigation or cleanup plan prepared for a particular site. It presents 1) a comprehensive discussion of the site background and the current conceptual site model for how contamination may be acting in the environment, and 2) a comprehensive sampling design addressing the site as a whole.

Follow-up QAPP Addenda are investigation or cleanup plans for any additional site work that needs to be conducted to complete the project. Follow-up QAPP Addenda start where the initial Addendum stopped. Thus, the background discussion only needs to address the findings from the previous QAPP Addendum that have created the need for the additional work.

The consultant should develop a sequential number system for site-specific QAPP Addenda to retain the context and flow of a site investigation or cleanup. For example, the initial QAPP Addendum on the first site investigated under an assessment grant might be A1. Follow-up QAPP addenda would continue the sequence with A2, A3, etc. The next site investigation would start with B1, and so on and so forth. If work on multiple grants is anticipated, the numbering sequence might want to include and added designation of the specific grant.

7.1 QAPP Addendum Construction

At a minimum, all initial and follow-up QAPP Addenda need to address the primary QAPP elements highlighted in Figure 3. Appendix B, Guidance for Site-Specific QAPP Addenda, provides detailed information on the concepts to be covered in each of these QAPP elements. When preparing an initial or a follow-up site-specific QAPP Addendum, the level of detail that needs to be presented in these sections is directly related to the extent and complexity of the work being performed. Whether large or small, site-specific QAPP Addenda must be complete and correct.

The following are some important concepts to highlight in preparing QAPP Addenda:

- Section A – Title and Approval Page / Introduction: All site-specific QAPP Addenda will need a Title and Approval Page and a brief introduction to set the stage for the work that follows. The introduction in a site-specific QAPP Addenda serves several key functions.
 - First, it sets the stage for the project and gives the reader an understanding of the project's current status.
 - Second, it establishes a direct link between the site-specific QAPP Addendum and the Generic QAPP that it is attached to. The introduction of each site-specific QAPP Addendum must include a complete reference to the Generic QAPP (title, revision number, date, and the EPA QA RFA number).
 - Third, it verifies the consulting firm's commitment to following the processes and procedures documented in their Generic QAPP, and when site work requires any modifications or additions to those procedures, they will be provided in the associated site-specific QAPP Addendum.
- Other Planning Documents: Managing more than one planning document (for the same site work) should be avoided when ever possible. Thus, if a larger planning document contains a sampling or data collection task that would trigger a site-specific QAPP Addendum, rather

than creating a second document, simply incorporate the QAPP Addendum into the larger plan. Or, if a consulting firm is used to creating a work plan type document, specific to their organization, they should not also create a site-specific QAPP Addendum that echoes the work plan. Adapting the work plan document to address the information needed in a site-specific QAPP Addendum, and managing only one document, is the much preferred method of operation.

- Problem Definition (Section C) for the site-specific QAPP Addenda: The sheer economics of Brownfields projects heighten the importance of understanding the background to the site. The better the understanding of the potential contaminants of concern and conceptual site model for the property, the more effective and efficient the sampling design strategy can be.

Historical data can play a significant role in understanding site contamination and designing the sampling strategy for the site. Thus, when a consulting firm uses historical data in the planning of a project, it should be evaluated and an assessment of its quality included in the background discussion. By providing the reviewers with a sense of the quality and reliability of the historical data, they are better able to evaluate and understand the sampling design strategy that is presented. Data of unknown quality can still be used, but it will affect the design strategy and quantity of samples that need to be collected.

In addition, when using historical data, the actual contaminants of concern and the magnitude of contamination present (relative to the project criteria) should be provided in the text of this section. Understanding that trichloroethene (TCE) was found at a particular location at a concentration just above the project criteria might suggest a grid pattern sampling strategy to look for any trends or potential hot spots. While a historical TCE concentration of ten times the project criteria might suggest narrowing the strategy to delineate the extent of contamination in that area.

- Sampling Design (Section E) – The “Why” Behind the Work: The sampling design discussion, presented in Section E, is one of the most important sections in the site-specific QAPP Addendum. Unfortunately, often times this planning information is brought up in meetings, but never translated into the QAPP Addendum. It is thus recommended that special attention be paid to strengthening this section in the site-specific QAPP Addendum. A detailed sampling design discussion helps the reader (and future readers) understand the thought process that went into designing the sampling strategy for the site. This section explains the “why” behind the sampling design, and what the strategy hopes to accomplish in addressing the objectives of the project.

Judgmental sampling designs are often the most common sampling strategy employed on Brownfields projects. When documenting a judgmental sampling design, it is important to not only discuss the sampling design strategy at a specific location, but also how these individual pieces fit together to adequately assess the whole site. In addition, detailed site sampling maps that conceptualize this discussion are essential for understanding the entire sampling design.

7.2 QAPP Addendum Review, Approval and Distribution

Figure 5 shows a flowchart diagram of the review, approval and distribution process for QAPP Addenda. Again, please note that hardcopies of the site-specific QAPP Addenda are usually not submitted until the review and approval process is completed unless they include several new SOPs or very complex diagrams that make them difficult to submit by email. Email communication, and electronic copies of all the documents, should be used throughout the review process. Electronic signatures are encouraged for approval of all site-specific QAPP Addenda (see section 8.0 for further details).

QAPP Addendum (Allow 30 days for EPA review.)

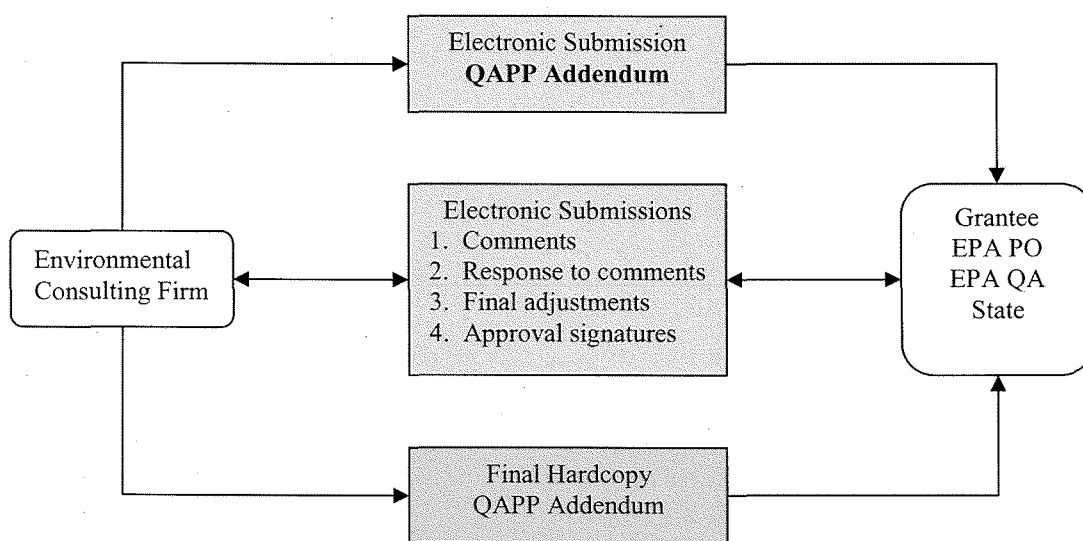


Figure 5 – QAPP Addendum Review, Approval and Distribution

8.0 QAPP Approval and Electronic Signatures

Signatures captured on the Title and Approval Pages of Generic QAPPs and site-specific QAPP Addenda will generally include the lead environmental firm's project manager and QA Officer, and EPA's Project Officer and QA Officer. This format will most often be the case for review and approval of the Generic QAPPs. For site-specific QAPP Addenda, it may be appropriate to include other project team member's signatures on the approval page. Depending on their level of involvement in the review and approval process, the state contact and/or the grantee may request to have their signatures included on the approval page. The inclusion of their signatures on site-specific QAPP Addenda should be worked out on an individual grant basis.

It should be noted that the EPA QA Unit signature provides approval of the Generic QAPPs and site-specific QAPP Addenda, and the EPA Project Officer's signature provides approval to begin the work.

To speed up the efficiency of obtaining signatures on the Title and Approval Pages, electronic signatures are acceptable and are the preferred method of transmission. Toward the end of the review process, the consultant should email a signed and dated copy of the Title and Approval Page to the EPA QA Officer (copying the entire project team). The EPA QA Officer will print the page, sign and date it accordingly, and then re-scan it into portable document format (pdf) and email the page to EPA Project Officer. The EPA Project Officer will repeat this process and email the page back to the consultant (or next person on the signature page). The completed signature page will then be included in the final hardcopy version of the Generic QAPP or site-specific QAPP Addendum and distributed to the project team.

If scanning technology is not available, the page may be signed and faxed to the appropriate next person. In addition, software packages offering electronic or digital signatures may also be used if they are compatible with the process.

Verbal approval to proceed with any part of the project will only be acceptable in rare instances, and should be followed-up with an email notification. When partial approval is requested, the agreement for the specific work to be conducted should be documented in an email to the project team.

Since the majority of environmental work tends to be seasonal and happening at the same time, EPA requires that the environmental consulting firm schedule a **30 Days** review and approval process into the project timeline. EPA understands that scheduling these projects often relies on timing with the consulting firm's subcontractors. With advance notice, EPA will work with the grantee and their consultant to try and meet an expedited schedule if there are extenuating circumstances. However, there are no guarantees that the expedited schedule can be accommodated.

NOTE: No on-site project work can begin without an approved Generic QAPP and an approved site-specific QAPP Addendum in place. Work conducted prior to QAPP approval will not be reimbursed by EPA.

9.0 References

Quality Assurance Guidance for Conducting Brownfields Assessments, EPA 540-R-98-038, September 1998: www.epa.gov/swerosps/bf/liab.htm