



**Quality Control Plan for Phase 2 Remedial
Investigation at the Tonawanda Landfill
Operable Unit in the Town of Tonawanda,
New York**

Revision 0

**Buffalo District
Formerly Utilized Sites Remedial Action Program**

**Prepared by:
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**For:
US Army Corps of Engineers – Buffalo District
Formerly Utilized Sites Remedial Action Program
Contract No. W912P4-07-D-0009, Delivery Order 0003**

October 2009, Revision 0



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Contract Number: W912P4-07-D-0009, Delivery Order 0003

QCP APPROVALS

By their specific signature, the undersigned certify that this QCP is approved for use during sampling and surveys at the Tonawanda Landfill Operable Unit in the Town of Tonawanda, New York.

APPROVED BY:

[Redacted Signature]

ARSEC - Project Manager

[Redacted Name]

10-19-09
Date

[Redacted Signature]

ARSEC – Radiation Safety Officer (RSO)

[Redacted Name], CHP

10-19-09
Date

By their specific signature, the undersigned certify that they reviewed and provided comments on this QCP for use during the performance of health physicist services at the Tonawanda Landfill Operable Unit in the Town of Tonawanda, New York.

[Redacted Signature]

ARSEC – ES&H Manager

[Redacted Name] PE, CIH, CSP

10-19-09
Date

[Redacted Signature]

ARSEC – President

[Redacted Name]

10-19-09
Date

[Redacted Signature]

ARSEC – Corporate Quality Manager

[Redacted Name]

10-19-09
Date



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ABBREVIATIONS, ACRONYMS, AND SYMBOLS

ACWP	Actual Cost of Work Performed
AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
ARSEC	American Remediation Solutions and Environmental Corporation
ASQ	American Society for Quality
BCWP	Budgeted Cost of Work Performed
BCWS	Budgeted Cost of Work Scheduled
CAD	Computer Aided Design
CEO	Chief Executive Officer
CHP	Certified Health Physicist
CIH	Certified Industrial Hygienist
COO	Chief Operating Officer
COR	Contracting Officer Representative
CPI	Cost Performance Index
CPM	Critical Path Method
CQCM	(Corporate) Contractor Quality Control Manager
CQCSM	Contractor Quality Control System Manager
CQM	Construction Quality Management
CRM	Customer Relation Management
CSP	Certified Safety Professional
DCAA	Defense Contract Audit Agency
DCGL	Derived-Concentration Guideline Level
DERP	Defense Environmental Restoration Program
DOE	Department of Energy
ES&H	Environmental Safety and Health
FUSRAP	Formerly Utilized Sites Remedial Action Program
G&A	General and Administrative
GIS	Geographical Information System
GPS	Global Positioning System
HP	Health Physicist
HTW	Hazardous and Toxic Waste
ISO	International Organization for Standardization
ITR	Independent Technical Review
JSS	Job Site Superintendent
LIMS	Laboratory Information Management Systems
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MIS	Management Information System
NQA	Nuclear Quality Assurance
NRRPT	National Registry of Radiation Protection Technologists
OSHA	Occupational Safety and Health Administration
PM	Project Manager
POC	Point of Contact
QC	Quality Control
QCP	Quality Control Plan
QCR	Quality Control Representative
QMS	Quality Management System
RMS	Resident Management System
SADA	Spatial Analysis and Decision Assistance

SPI	Schedule Performance Index
SOP	Standard Operating Procedure
SS	Site Superintendent
TO	Task Order
USACE	United States Army Corps of Engineers
USAESCH	United States Army Engineering Support Center, Huntsville
VSP	Visual Sample Plan
WBS	Work Breakdown Structure

1.0 MANAGEMENT PHILOSOPHY

ARSEC’s management philosophy will combine the proven resources of American Radiation Services Inc. (ARS) and Safety and Ecology Corporation (SEC) to consistently execute this task order (TO) to meet USACE expectations regarding cost, performance, schedule, and mission. The foundation of this team begins with ARSEC and our experience in providing environmental services for multiple USACE Districts nationwide as well as other government contracts.

ARSEC Management Philosophy

- Provide dedicated local Project Manager with the required technical expertise
- Ensure local resources are identified and utilized as much as possible to reduce costs and increase efficiency
- Implement a task-specific QCP to include all elements of quality as required by our Corporate QMS
- Define cost/schedule requirements and proactively control upfront to ensure expectations are attained

The Project Manager (PM), [REDACTED], will be responsible for the overall management of the TO, including cost, schedule, and technical quality. He will represent ARSEC on daily operational matters as appropriate. ARSEC maintains a comprehensive Quality Management System (QMS) that is consistent with the requirements of ANSI/ISO/ASQ Q9001-2000, *Quality Management Systems*, 10 CFR 830.120, *Quality Assurance Criteria*, and the American Society of Mechanical Engineers NQA-1-2004, *QA Requirements for Nuclear Facility Applications*. The ARSEC QMS will provide the basis of the quality system used for the Tonawanda Landfill Operable Unit Project, while this Project Quality Control Plan (QCP) has been developed to be directly applied to the final scope of work.

The Contractor Quality Control System Manager (CQCSM), Jim Turner, reports directly to the ARSEC Corporate CQC Manager. Issues of non-compliance to the QCP that cannot be resolved at the project level will be elevated to the ARSEC President. The CQCSM or designated Project Quality Control Representative will be responsible for ensuring compliance to the Project QCP by assessing project activities on day-to-day basis.

The ARSEC President and/or Corporate CQCM will provide the CQCSM or designated Project Quality Control Representative the authority to stop work that is not compliant with the contract. The CQCSM or designated Project Quality Control Representative will approve the restart of operations when approved corrective actions have been completed and verified by the Quality Control (QC) staff. Figure 1-1 describes the reporting lines of authority and communication channels associated with QC for this project. The QC organizational structure and lines of authority ensure independent and objective oversight.

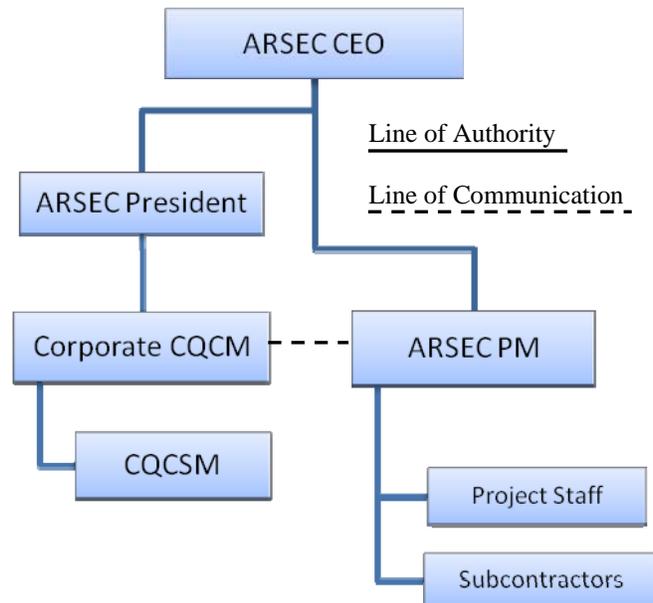


Figure 1-1. QC Organizational Structure

Peer Reviews

ARSEC member firms conduct peer reviews on a scheduled basis to assess compliance with corporate QMS requirements and objectives. These reviews are done on a project basis and reported to each respective Corporate President at ARS and SEC. A few of these peer reviews conducted recently are included in Table 1-1. The CQCM will assess core drilling sampling and laboratory activities.

Table 1-1. Recent Peer Reviews Conducted by ARSEC Member Firms

Date/Client	Person Conducting Peer Review	Modifications Implemented
October 2008/UT-B	CQCSM	Reviewed and revised corporate procedure to ensure craft personnel are adequately trained and monitored for work in structures potentially containing beryllium contamination
July 2008/B&W Y12	CQCSM	Developed an internal SOP for tracking and inspecting fall protection and designated a DCP
July 2008/B&W Y12	CQCSM	Revised the Corporate SOP for measuring temperature during concrete placement testing
March 2008/ALCOA	CQCSM	Established a Designated Competent Person for concrete placement
Nov 2007/LANL	CQCSM and COO	Initiated request for copier/scanner to download safety and health/quality records to mainframe server
Sept 2007/ALCOA	CQCSM and COO	Modified excavator with a protective cage to protect operator from flying debris
June 2007 ALCOA	ES&H Manager	Reassigned responsibilities for health and safety paperwork to project coordinator to allow more time to ES&H Rep
May 2007/TDEC	CQCSM	Replaced rebar protectors with correct ones
Mar 2007/ Chevron Remedial	Project Manager	Initiated a heat stress monitoring system
Jan 2007/LANL	Project Manager	All confined spaces labeled and registered with LANL
Aug 2006/B&W Y12	CQCSM	Reviewed safety aspects of operating pole driving equipment
May 2006/B&W Y12	Environmental Safety and Health (ES&H) Manager	Provided re-training in working overhead
Dec 2006/UTB SNS	CQCSM	Improved process for procuring quality related items

Frequent project assessments are performed as detailed in Table 1-2. Each assessment provides opportunities for the team to determine areas for improvement. A computer-based issues management, tracking and resolution program allows the team to monitor corrective actions and their implementation. The location of the project team at the site enhances the team's responsiveness as all needed resources are centrally located to provide direction to the project.

Table 1-2. Frequent Project Assessments Ensure Quality Control

Assessment*	Frequency	Lead	Participants	Purpose
Operational Walkdown	Daily	PM	Various	<ul style="list-style-type: none"> • Ensure work performed according to plan • Identify changing conditions
Safety Walkdown	Daily	ES&H Rep.	Various	<ul style="list-style-type: none"> • Ensure hazard mitigation is executed • Identify new/unexpected hazards
Equipment Inspection	Daily	HP	ES&H Rep, PM	<ul style="list-style-type: none"> • Pre-use inspection of equipment and material
QC Surveillance	Daily	QC Rep.	PM	<ul style="list-style-type: none"> • Ensure work performed according to workplans, specs, requirements
ES&H Surveillance	Weekly	ES&H Rep.	PM	<ul style="list-style-type: none"> • Assess implementation of ES&H plan, procedures, specs
QC Assessment	Weekly	CQCSM	PM, SS, ES&H Rep.	<ul style="list-style-type: none"> • Assess implementation of at least 1 aspect of Corporate QMS
ES&H Assessment	Monthly	ES&H Manager	PM, SS, QC Rep.	<ul style="list-style-type: none"> • Assess implementation of at least 1 aspect of ES&H plan
Corporate Assessment	Quarterly	PM	CEO, Corporate CQCM, ES&H Manager	<ul style="list-style-type: none"> • Review assessment findings with corporate staff

* Any issue or observations will be accessible to the Contracting Officer Representative (COR) as well as corrective actions and resolutions. COR is invited to attend any/all assessments

2.0 MANAGEMENT APPROACH

The ARSEC Management Approach is focused on efficient operations to include the following elements to ensure performance objectives and safety standards are maintained:

- Accurate Project Planning and Scoping
- Detailed Documentation, Reporting, and Data Quality
- Project Communications
- Safety and Health Integration
- Management Continuity and Flexibility

This approach will be implemented by the ARSEC Project Manager through the supporting infrastructure developed to ensure the resources are available to meet TO objectives. Each of these elements will be addressed in more detail below.

ACCURATE PROJECT PLANNING AND SCOPING

ARSEC's experience in remediation projects has underscored the importance of comprehensive planning prior to work start to ensure budget, schedule, and performance commitments can be attained. As such, ARSEC has developed a management methodology that emphasizes documentation management, control and accountability while providing the continuity and flexibility necessary to move with the project.

Our planning process began with receipt of the Tonawanda Landfill Operable Unit TO from the USACE and includes scoping exercises to develop a final critical path method (CPM) schedule to ensure adequate resources are defined and available to support associated production goals. This planning process is led by ARSEC's Project Manager and includes the key personnel identified in the organization chart in Section 3.0. The objective of this process is to map out the logistical requirements to be considered for mobilization and operations. As more information becomes available regarding the Tonawanda Landfill Operable Unit TO, scoping will include the following considerations and verification steps:

1. Assess project requirements (technical, regulatory, and management)
2. Quantify staffing and select personnel from team, subcontractors (if any), and labor pools
3. Verify certifications, licenses, and documentation, availability, or define how they will be obtained
4. Assess equipment/hardware requirements and mobilization requirements
5. Create a baseline budget and schedule
6. Develop a mobilization plan for movement and transition of resources

The final work breakdown structure (WBS) will be verified and loaded into the final CPM schedule to support the TO objectives using *Primavera Project Planner (P5)*, adding appropriate activity durations and logic. In developing final project budgets for the USACE, ARSEC will incorporate the cost proposal developed for the TO.

A final project baseline will be completed and provided to USACE for approval to ensure common understanding of performance objectives, schedule milestones, and reporting/communication requirements based on initial discussions after contract award.

DETAILED DOCUMENTATION, REPORTING, AND DATA QUALITY

A critical component to ensuring efficient operations is monitoring performance through accurate document management and reporting. This is a function of the management information system (MIS) that supports the infrastructure of the ARSEC Team, as well as a function of an integrated support team to provide information in a format that provides value to the PM and USACE COR. The PM provides leadership within the ARSEC infrastructure to provide a service to each project team to ensure data and

reports regarding performance provide the insight needed to operate under the TO. The ARSEC Team approach to supporting this objective is presented in Figure 2-1. This approach provides the administrative and infrastructure personnel necessary to ensure reporting and documentation requirements include compliance with applicable data quality standards and meet the needs of USACE.

The ARSEC Team will leverage in-place procedures and systems developed to expedite contract startup and to minimize performance risk. For example, we have an established Safety and Health (S&H) program, structured Quality Control (QC) procedures, USACE-approved templates for work plans and cost reports, formal and informal communication networks, institutional knowledge of and established relationships with USACE customers and regulatory agencies, and approved advance agreements and standard operating procedures (SOP). As PM, [REDACTED]. [REDACTED] will serve as the primary point of contact (POC) to the government on this contract. Dedication of [REDACTED] to this position ensures USACE that the PM will have full authority to

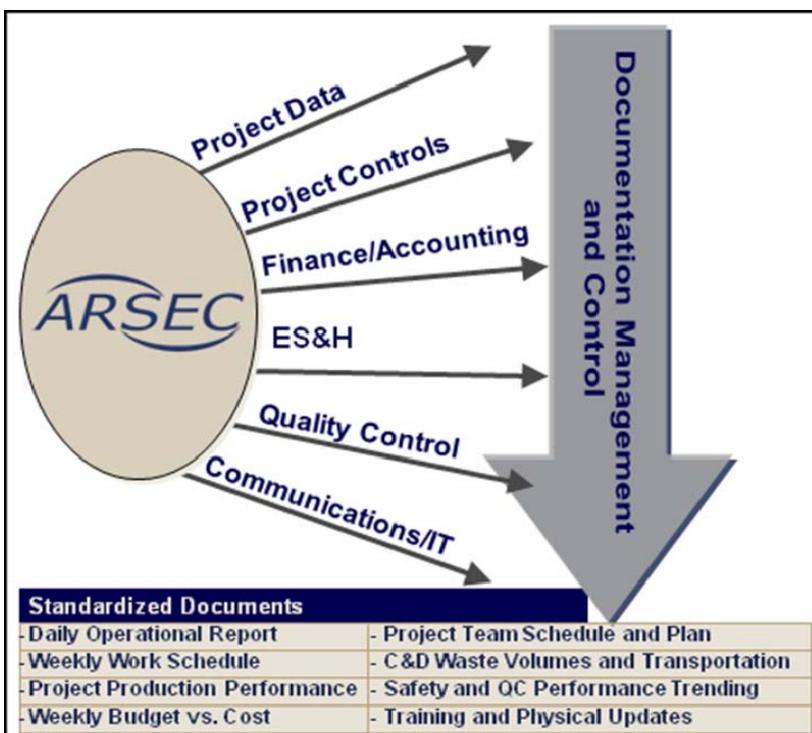


Figure 2-1. ARSEC Administrative and Infrastructure Support

access necessary resources within the ARSEC Team to meet project commitments throughout the duration of the contract to resolve issues and problems as they arise.

PROJECT COMMUNICATIONS

The PM works daily/weekly with the dedicated project controls representative to track the progress of the project from a schedule, cost and budget perspective. When problems or issues are identified, the PM will notify the Contracting Officer Representative (COR) verbally and in writing through a notice of deficiency if applicable. Then the PM will identify and recommend corrective actions to recover cost or schedule (if impacted) and track the problem/issue formally through the CPM Schedule and the ARSEC Team MIS. The system tracks corrective actions using a timeline of defined milestones so that no issue/problem goes unresolved. Once resolution is complete, formal documentation is provided to the COR outlining the process, and it is taken out of the corrective action process.

In addition, the ARSEC Team has established a comprehensive QC program consistent with USACE Construction Quality Management (CQM). This program provides the foundation of our capabilities and provides trending and performance reporting relative to quality and allow our management team to understand the direction of their project team prior to generation of problems.

SAFETY AND HEALTH INTEGRATION

Providing a work environment and processes that will ensure the safety of the employees, onsite personnel and local neighboring residents is a key element to the operational plan. Quality Controls along

with Safety and Health will be implemented on the Tonawanda Landfill Operable Unit site by the ARSEC Team to ensure personnel safety and regulatory compliance are maintained. As depicted in Figure 2-2, the ARSEC Team conducts project-specific hazard analysis using the EM 385-1-1 five step process to ensure worker safety through all activities and phases of the project. The process is performed in coordination with the 3-phases of quality control. Working together, the ARSEC Team develops hazard control strategies in Activity Hazard Analyses (AHA) that are fully protective of our employees, ensure regulatory compliance, incorporate best management practices, and integrate with QC functions. Hazard identification is performed during the planning phase of the project, linking hazards to Definable Features of Work.

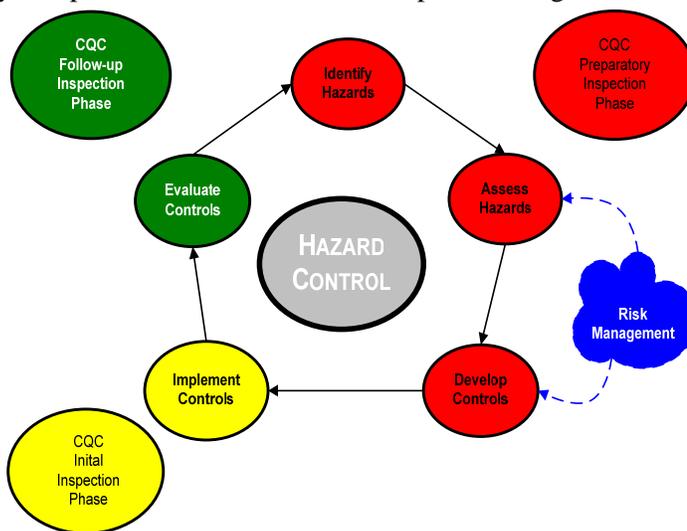


Figure 2-2. The ARSEC Integrated System Management Process

MANAGEMENT CONTINUITY AND FLEXIBILITY

The ARSEC Project Team and HP Team will be based in ARSEC offices in Pittsburgh, Port Allen, and Knoxville. The ARSEC Project Manager, [REDACTED], and Corporate CHP, [REDACTED], will maintain regular communications with USACE through the USACE COR. [REDACTED] manages the Knoxville, TN and Greenville, SC offices of ARSEC member firm ARS and maintains a senior management role in the firm. He will have the authority to provide resources as needed to meet project requirements. To maintain continuity of operations during the duration of a project, ARSEC will routinely solicit feedback from the client and employees to determine if any problems or issues exist. If identified, ARSEC will implement our Issue Management Procedure (ARSEC-Q-15). This procedure requires investigation and research of an issue until it is fully understood and sufficient corrective action is in place. Corrective actions are monitored and continually evaluated until the issue has been resolved to the client’s satisfaction.

The ARSEC Corporate QMS describes the quality system that ensures QC provisions are established in lower tier QC plans. The system addresses standards such as USACE, EM-1110-35-1, *Engineering and Design-Management Guidelines for Low-Level Waste and Mixed Waste Site Remediation*; American National Standard, ANSI/ASQC E4, *Specifications and Guidelines for Quality Systems and Environmental Technology Programs*; and ANSI/ISO/ASQ Q 9001-2000 *Quality Management Systems*. The QMS is implemented using the ARSEC SOPs listed in Table 2-1. The QMS and sub tier QC plans have been audited and approved by several prime contractors to the U.S. Government and have also been approved for use by state agencies.

Table 2-1. ARSEC Standard Operating Procedures

SOP Type	Document #	Title
ES&H Procedure	HS-101	Confined Space
ES&H Procedure	HS-102	Accident Investigation
ES&H Procedure	HS-103	Electrical Work
ES&H Procedure	HS-104	Fall Protection
ES&H Procedure	HS-105	Hazard Communications
ES&H Procedure	HS-106	Hearing Conservation
ES&H Procedure	HS-107	Temperature Extremes
ES&H Procedure	HS-108	Hoisting and Rigging
ES&H Procedure	HS-109	Ladders and Scaffolds

SOP Type	Document #	Title
ES&H Procedure	HS-110	Lockout/Tagout
ES&H Procedure	HS-111	Respiratory Protection
ES&H Procedure	HS-112	Permit Required Confined Spaces
ES&H Procedure	HS-113	Trenching and Excavations
ES&H Procedure	HS-114	Bloodborne Pathogens
ES&H Procedure	HS-115	Welding, Cutting and Compressed Gas Cylinders
ES&H Procedure	HS-116	Activity Hazard Analysis Development and Use
ES&H Procedure	HS-117	Building Emergency Plan
ES&H Procedure	HS-118	Personal Protective Equipment
ES&H Procedure	HS-119	Industrial Hygiene Sampling
ES&H Procedure	HS-120	Training Practices
ES&H Procedure	HS-121	Risk Management Review Safety Triggers
Quality Procedure	Q-01	Quality Management System
Quality Procedure	Q-02	Training and Qualification
Quality Procedure	Q-03	Design Control
Quality Procedure	Q-04	Procurement Control
Quality Procedure	Q-05	Instructions, Procedures, and Drawings
Quality Procedure	Q-06	Document Control
Quality Procedure	Q-07	Control of Purchased Materials, Items, and Services
Quality Procedure	Q-08	Identification and Control of Items
Quality Procedure	Q-09	Control of Special Processes
Quality Procedure	Q-10	Inspection
Quality Procedure	Q-11	Test Control
Quality Procedure	Q-12	Control of M&TE
Quality Procedure	Q-13	Handling, Storage, and Shipping
Quality Procedure	Q-14	Inspection, Test, and Operating Status
Quality Procedure	Q-15	Issue Reporting
Quality Procedure	Q-16	Records Management
Quality Procedure	Q-17	Assessments
Quality Procedure	Q-20	Suspect & Counterfeit Items
Quality Form	D-1	Nonconformance Report (NCR)
Quality Form	D-2	Corrective Action Request (CAR)
Quality Form	D-3	NCR/CAR Tracking Log
Quality Form	D-4	Preparatory Phase Checklist
Quality Form	D-5	Initial Phase Checklist
Quality Form	D-6	Follow-Up Inspection Form
Quality Form	D-7	Final Inspection Checklist
Quality Form	D-8	Daily Quality Control Report (DQCR)
Quality Form	D-9	Transmittal Form
Quality Form	D-10	Submittal Register
Quality Form	D-11	Request For Information
Quality Form	E-1	Mobilization Checklist
Quality Form	E-2	Utility Clearance Checklist
Quality Form	E-3	Instrument Calibration Checklist
Quality Form	E-4	Surveying Checklist
Quality Form	E-5	Field Documentation Checklist
Quality Form	E-6	Demobilization Decontamination Checklist
Quality Form	E-7	Data Management Checklist
Quality Form	E-8	Reports and Other Documents
Quality Form	E-9	Field Safety Checklist
Quality Form	E-10	Sample Collection Checklist
Quality Form	E-11	Packing, Storing, and Shipment of Samples Checklist
Operations Procedure	OPS-001	Operations Project Management Manual
Operations Procedure	OPS-201	Readiness Review

CQC PHASED WORK

The implementation of QC requirements is mandatory for all ARSEC employees and lower-tier subcontractors to ensure that ARSEC provides a service of known quality during the performance of any contract. Our QC system consists of the plans, procedures, and organization necessary to produce an end product that complies with the contract requirements. ARSEC's Project QCP will incorporate and describe implementation of the U.S. Army Corps of Engineers Unified Facilities Guide Specifications, UFGS 014501, Contractor Quality Control. To ensure overall quality requirements are met and exceeded, the project manager defines the resources and experience available throughout the planning, execution, and control of the TO. ARSEC integrates our quality management approach into our project team structure by conducting work in three primary phases, as shown in Figure 2-2, including:

Preparatory Phase: This phase occurs prior to beginning each definable work feature after all USACE – Buffalo District approved plans/documents/materials copies are onsite. Applicable specifications, reference codes, standards, and contract drawings reviews will be performed and copies of each maintained onsite. This review ensures all equipment and/or materials have been tested, submitted, and approved and provisions have been made for required control inspection and testing. ARSEC will ensure vendor and supplier adequacy and specified requirements conformance through implementation methods for supplier and vendor quality described in ARSEC-Q-04, "Procurement Control." A work area examination will ensure all required preliminary work has been completed and complies with the contract. ARSEC will verify through physical examination that required materials, equipment, and sample work are on hand, conform to approved shop drawings or submitted data, and are properly stored. AHA reviews will ensure safety requirements are met. The CQCSM or designated Project Quality Control Representative will conduct a meeting attended by the PM, other CQC personnel, and the Job Site Superintendent (JSS) responsible for the definable feature to discuss procedures for controlling the work quality including repetitive deficiencies and the initial control phase. Construction tolerances and workmanship standards will be documented for the definable work feature being discussed. The CQCSM or designated Project Quality Control Representative will document preparatory phase actions in separate minutes.

Initial Phase: This Phase will occur at the beginning of each definable work feature and be repeated for each new onsite work crew, or any time acceptable specified quality standards are not being met. The CQCSM or designated Project Quality Control Representative will verify work is performed in full compliance with contract requirements by implementing methods prescribed in ARSEC-Q-02, "Personnel Training and Qualifications," and ARSEC-Q-17, "Assessments." During Plan of the Day (POD) meetings, ARSEC will ensure that: 1) preparatory meeting minutes are reviewed with project personnel; 2) controls are verified as adequate to be fully contract compliant and control inspection and testing are those required; and 3) establish and communicate to all personnel an expected workmanship level. Any differences found during the reviews, checks, and verifications will be resolved to compliance status. Safety will be verified as compliant with the safety plan and applicable AHA. Any safety upgrade will be incorporated in the safety plan with each worker trained to the affected AHA.

Follow-up Phase: The CQCSM or designated Project Quality Control Representative will perform daily checks to ensure QC activities provide continued contract requirements compliance and will continue these daily checks until the particular work feature's completion. All checks will be recorded in the CQC documentation. Final follow-up checks will be conducted and all deficiencies corrected prior to the start of additional work features that may be affected by deficient work.

3.0 MANAGEMENT STRUCTURE

ORGANIZATIONAL APPROACH

ARSEC will programmatically manage this contract from its Knoxville, TN office which currently includes the primary office for the Project Manager. The Pittsburg, Port Allen and Knoxville offices will provide support to the project with equipment and resources as necessary. ARSEC's organizational approach for this TO will provide the following benefits for the Buffalo District:

- **Continuity.** Providing an experienced and proven Team with depth of staff in providing local health physics professionals and technicians.
- **Commitment.** Committing key resources local to the Tonawanda Landfill Operable Unit project with experience working on USACE projects, to ensure that we not only meet but exceed all expectations.
- **Communication.** Establishing communication protocols between the ARSEC and USACE personnel to ensure smooth flow of information with best value constantly in mind.
- **Control.** Application of the appropriate people, systems, processes, and procedures in place to manage the Tonawanda Landfill Operable Unit project TO within budget and schedule, while maintaining quality and safety.

Overall Authority: As the prime contractor, ARSEC is the sole entity with a contractual relationship with USACE and has overall authority for this contract. We will leverage in-place procedures (see Table 2-1)/systems developed in executing over 20 FUSRAP and over 130 DOE projects to expedite contract startup and to minimize performance risk on the TO. For example, we have an established S&H program, structured QC procedures, USACE-approved templates for work plans and cost reports, formal and informal communication networks, institutional knowledge of and established relationships with your customers and regulatory agencies, and approved advance agreements/SOPs.

Single POC for the Contract: Steve Shirley will be the Project Manager and single POC for the government on this contract. Mr. Shirley has served as Project Manager on similar projects throughout the country over his 25-year career. He has personally led the development of all elements of this document, preparation of the ARSEC proposal, and attended the initial site walk.

POC for Tonawanda Support

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Organizational Composition: Figure 3-1 on the next page depicts the organization structure, including associated lines of authority, proposed for ARSEC's support to Buffalo USACE for the Tonawanda Landfill Operable Unit project. These positions may change as the project scope and complexity evolves.

Table 3-1 below provides additional detail regarding the specific position responsibilities anticipated to be in place to support the Tonawanda Landfill Operable Unit project. Qualifications and experience for the project team are documented in Table 9-1, Summary Chart of Key Personnel - Qualifications / Certifications.

Table 3-1. Responsibilities of the Tonawanda Landfill Operable Unit Project Team Members

Name	Title	Responsibilities
██████████	Project Manager (PM)	<ul style="list-style-type: none"> • Single POC to Buffalo USACE • Facilitates client partnering and planning • Accesses resources from Team subs • Assigns personnel and equipment resources • Implements staffing, recruiting and training plans as needed
██████████	Corporate Contractor Quality Control Manager (CQCM)	<ul style="list-style-type: none"> • Manages the incorporation of the Corporate Quality Management System during the project • Reviews and approves project workplans • Communicates with CQCSM daily regarding quality items • Leads Independent Quality Assessments • Reviews inspections for materials, equipment, and supplies • Ensures compliance with plans and SOW • Oversees three-phase inspection process
██████████	Contractor Quality Control System Manager (CQCSM)	<ul style="list-style-type: none"> • Oversees all quality control activities • Develops SOPs/procedures for submittals, verification, and acceptance testing • Manages QC inspectors • Inspects all materials, equipment, lab equipment, and field work • Ensures compliance with plans and SOW • Implements three-phase inspection process • Tracks deficiencies; issues corrective actions
██████ ████████	Site Superintendent	<ul style="list-style-type: none"> • Manages and executes site activities • Oversees/monitors subcontractor performance • Assigns personnel to daily tasks • Conducts daily, weekly status meetings • POC for Quality Assurance/Quality Control Issues
██████████, CHP	Project Health Physicist and Corporate Radiation Safety Officer (RSO)	<ul style="list-style-type: none"> • Oversight/review of all radiological activities and data • Review radiological data deliverables from analytical laboratories • Interface with laboratory client services coordinators and coordinating the resolution of laboratory problems • Take appropriate actions to address radiological emergency situations • Ensure that ARSEC radiation safety and survey plans and procedures are properly implemented and followed • Perform audits to verify proper implementation of approved HSRPP
██████████	Site Safety and Health Officer (SSHO)	<ul style="list-style-type: none"> • Provides oversight of all safety and health related requirements • Maintains a safety and health logbook • Controls access within site boundaries • Conducts daily, weekly status meetings with SS • Determines and informs project personnel of hazards • Medical Response Designee

¹ Dual role as Site manager / Field Supervisor and Site Safety and Health Officer

Table 3-1. Responsibilities of the Tonawanda Landfill Operable Unit Project Team Members

Name	Title	Responsibilities
[REDACTED], CHP and NRRPT	Site RSO	<ul style="list-style-type: none"> • Responsible for FSS technical implementation • Modifies/stops work for unsafe conditions • Contact for emergency/contingency plans • Provides direction in PODs • Approval of work changes and evaluation of change of condition
[REDACTED], PG	Professional Geologist	<ul style="list-style-type: none"> • Responsible for technical oversight of all drilling operations • Record all soil boring activities on Buffalo District supplied Engineer (ENG) Form 5056-R and/or 5056A-R • Prepare and submit boring logs. • Complete soil classification in accordance with ASTM standards.
[REDACTED]	Laboratory Manager	<ul style="list-style-type: none"> • Ensure that project needs are identified to laboratory personnel. • Provide direction/support for administrative and technical project staff • Interface with laboratory project staff on technical issues • Provide QA oversight for analytical data • Ensure that laboratory personnel understand and conform with elements of the SAP (e.g., FSP and QAPP) • Provide management oversight of ARS Laboratory and Assaigai Laboratory (a wholly-owned subsidiary of ARS)

4.0 TOOLS

4.1 SOFTWARE

Microsoft Office

Microsoft Office is an office software suite from Microsoft for Microsoft Windows and Apple Mac OS X operating systems. Along with core office applications, it includes associated servers and web-based services.

Corel

Corel Graphics software SuiteX3 is used to provide vector illustration and layout, comprehensive and feature-rich photo and bitmap editing, and precision bitmap-to-vector tracing.

MARSSIM Power

MARSSIM Power is decommissioning software that provides ARSEC with an easy-to-use application for evaluating alternative survey designs, calculating exact numbers of samples, and preparing prospective and retrospective power curves as described in MARSSIM.

COMPASS

Decommissioning software designed to facilitate the use of MARSSIM and guide the user into making informed decisions in designing final status radiological surveys.

Spatial Analysis and Decision Assistance (SADA)

SADA is software that incorporates tools from environmental assessment fields into an effective problem solving environment. These tools include integrated modules for visualization, geospatial analysis, statistical analysis, human health risk assessment, ecological risk assessment, cost/benefit analysis, sampling design, and decision analysis.

Visual Sample Plan (VSP)

VSP is a software package that provides statistical solutions to sampling design, mathematical and statistical algorithms, and a visual interface, while answering two important questions in sample planning:

- 1) How many samples are needed? VSP can quickly calculate the number of samples needed for various scenarios at different costs.
- 2) Where should samples be taken? VSP instantly provides random or gridded sampling locations overlaid on a user input site map to achieve the desired objective.

EPA HASP

e-HASP2 is an electronic and interactive program that provides "model" language that is acceptable to OSHA in preparing a site's HASP. The software includes decision logic to assist the user in determining the appropriate controls for health and safety hazards on their sites. The integrated chemical database includes numerous chemicals and updated exposure limits. Some of the other notable attributes of e-HASP2 include:

- 1) Upgrades to pick-lists
- 2) Function to add new chemicals that are not in the chemical database
- 3) Function to export reports to a word processor for editing
- 4) New "preview chapter" button
- 5) A newly designed job hazard analysis (JHA) chapter

AutoCAD

AutoCAD software is the 2D drafting and detailing and 3D design tool used by ARSEC. It provides native DWG compatibility, plus it allows custom program applications and allows the addition of a third-party application to meet specific design requirements. AutoCAD integrates new and enhanced productivity tools, presentation graphics, CAD standards, and more for faster, easier data creation and sharing.

Arcview

The graphical information system (GIS) application *Arcview* allows ARSEC to load, view, edit and export geodata. As an example, digital maps and CAD files are generated from global positioning system- (GPS) driven gamma radiation surveys. The resultant radiological walkover data and GPS location data is downloaded into the Arcview plotting program to provide a graphic description of the survey effort.

Laboratory Information Management Systems (LIMS)

LIMS is computer software that is used in the laboratory for the management of samples, laboratory users, instruments, standards and other laboratory functions such as invoicing, plate management, and work flow automation. Both the ARS Radiochemistry Laboratory and the TestAmerica St. Louis Laboratory have sophisticated LIMS that provide internal and external tracking of samples and sample results.

MAS200

MAS200 is an accounting software package that provides core accounting, e-commerce, business intelligence tools, payroll, customer relationship management (CRM), sales force automation and financial reporting. In addition, it automates key processes, including inventory management, bill of materials and job costing, utilizing an SQL or client/server platform.

S2

S2 is a project accounting package that is 100% DCAA compliant. It allows the management of accurate project cost data. The program also contains GSA schedule and non-schedule revenue recognition features.

Primavera Cost Manager®

Primavera Cost Manager® is an earned value reporting system that evaluates cost and schedule data to produce variance reports, updated cost to completion estimates, and other pertinent metrics to measure performance. It is uniquely configured to gather, analyze, and distribute information that measures the physical accomplishment of work on a project against the approved plan and its associated cost as compared to the approved budget.

4.2 INSTRUMENTATION

The following lists represent the inventory of radiological and environmental equipment that will be used by ARSEC during performance of work. This equipment is calibrated and stored in compliance with applicable standards to ensure QC protocols are maintained.

Meters

- Ludlum Model 2 Survey Meter
- Ludlum Model 3 Survey Meter
- Ludlum Model 4 Survey Meter
- Ludlum Model 12 Survey Meter
- Ludlum Model 2221 Portable Scaler

- Ludlum Model 2223 Scaler Ratemeter
- Ludlum Model 2224 Alpha Beta Scaler Ratemeter
- Ludlum Model 2224-1 Alpha Beta Scaler Ratemeter
- Ludlum Model 2225 Alpha Beta Ratemeter
- Ludlum Model 2241 Digital Scaler Ratemeter
- Ludlum Model 2241-2 Digital Scaler Ratemeter
- Ludlum Model 2350-1 Data Logger
- Ludlum Model 2360 Digital Scaler Ratemeter

Alpha/Beta Detectors

- Ludlum Model 43-68 100 cm² Gas Proportional Detector
- Ludlum Model 43-89 100 cm² Alpha Beta Scintillator

Alpha/Beta/Gamma Detectors

- Ludlum Model 44-7 Thin End Window G-M Detector
- Ludlum Model 44-9 Pancake G-M Detector
- Ludlum Model 44-25 Pancake G-M Hand Frisker

Air Samplers

- F&J LV-1 Low Volume (0-100 l pm)
- F&J HV-1 High Volume (0-4 cfm)
- Staplex TFIA High Volume (0-30 cfm)
- Lapel Escort Elf (0-5 l pm)
- Lapel GilAir-5 (0-5 l pm)
- Lapel SKC 224-PCXR4 (0-5 l pm)
- Air Sampler Calibrators (D-550, D-812, D-814 and others)
- PM-10 Air Samplers

NaI Detectors

- Ludlum Model 44-10 2"x2" NaI Gamma Scintillator
- Spectrum 489-55 Gamma Scintillator
- Teledyne G-5 Fiddler Gamma Scintillator
- Bicron B2/5 Fiddler Gamma Scintillator

Specialty Equipment

- Calibration Check Sources
- Exploranium GR-135 hand held gamma spectrometer
- Trimble GPS Systems [large and small detector coverages]

5.0 SCHEDULING

The ARSEC Team's initial project schedule for the Tonawanda Landfill Operable Unit Project is depicted below in Figure 5-1. This schedule will be updated as progress is made and expanded to include additional activities as the TO progresses and ARSEC increases participation. The active project CPM schedule will be managed and updated independent of this QCP as described in Section 7.0.

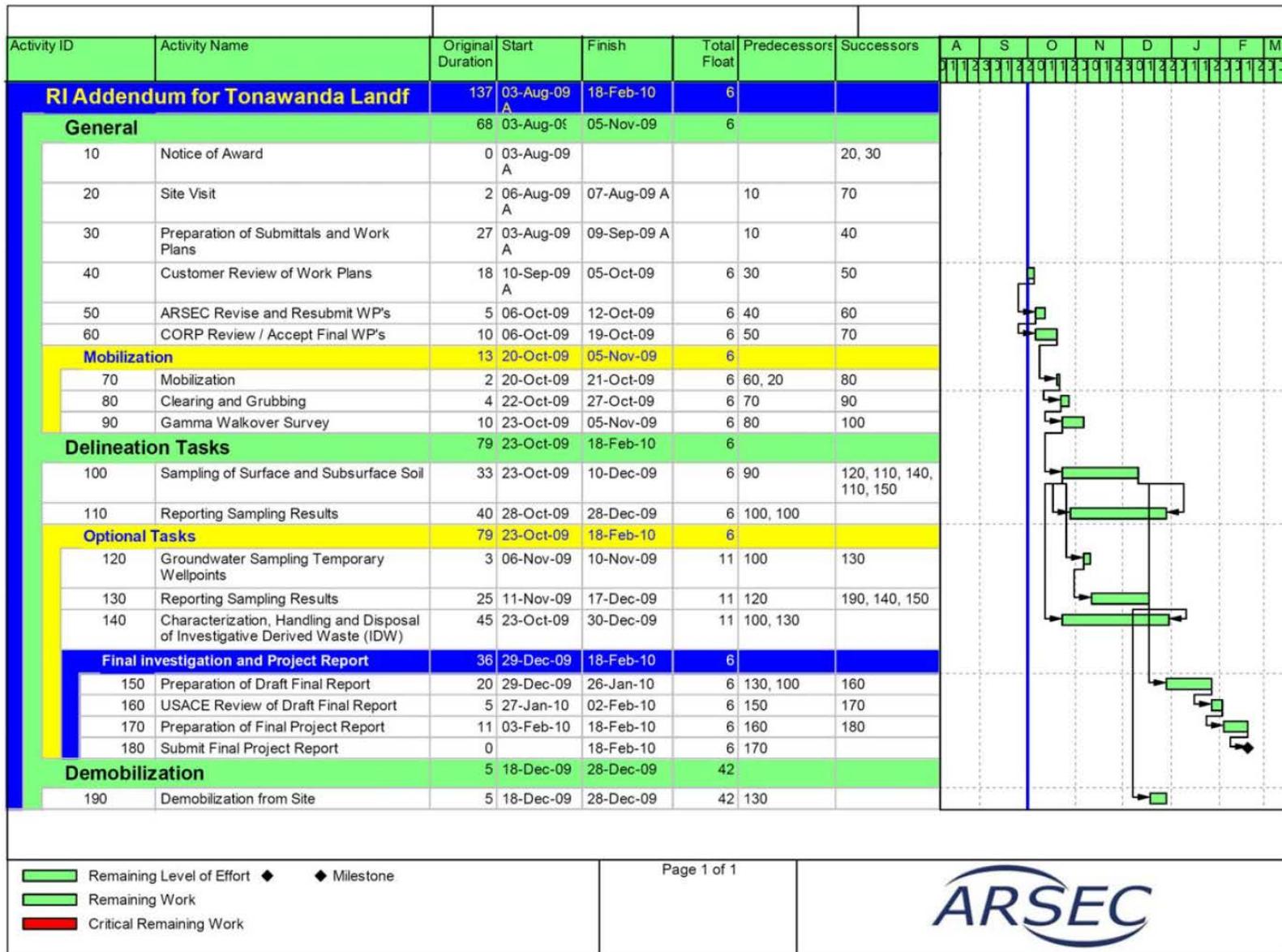


Figure 5-1. Tonawanda Landfill Operable Unit Project CPM Schedule

6.0 COST CONTROL FOR COST REIMBURSABLE AND FIRM FIXED PRICE CONTRACTS

ARSEC has established a complete contract management program that has been used to manage over 250 government contracts in the past 15 years. This program is based on the ARSEC Contracts Manual which includes processes for adaptation to firm-fixed price, time and materials, and cost reimbursable contracts. The manual developed is required reading and training by our project managers prior to deployment on contracts. ARSEC maintains these manuals through the Corporate QMS and records management program to ensure controlled copies are distributed with updates and modifications. Each section of the manual includes specific procedures associated with contract management and execution. For example, ARSEC requires project managers to understand through training the rates structure included into each labor rate to ensure common understanding of overhead and G&A financial considerations.

ACCOUNTING SYSTEM APPROACH

As defined in greater detail in the section below, ARSEC has implemented a comprehensive accounting system through application of MAS200 and S2 Project Accounting (refer to Section 4.1 for software descriptions). This system has been developed for each type of government contracting to integrate the cost codes required for maintaining Defense Contract Audit Agency (DCAA) requirements. ARSEC's approach to providing project accounting system support to this contract is to provide access to ARSEC's MAS200/S2 system via Internet through remote locations and projects. This is implemented through wireless networks and provides project manager access to all financial information including rates, labor types and categories, overhead and G&A accounts, fee, as necessary to manage the TO. ARSEC trains each manager on the approach used to develop indirect rates and the requirements for effective management of fee and unallowable accounts. ARSEC has passed four DCAA audits regarding the justification of our rates structures and these rates are used consistently on all of our cost reimbursable contracts. The MAS200/S2 accounting system is recognized by DCAA as an approved program for cost reimbursable government contracts due to its structure to certify rate build-ups as well as its capability for reporting.

BUDGETING AND ACCOUNTING REPORTS

ARSEC's MIS generates a wide variety of reports from MAS200/S2, Cost Manager, P5, and Timberline, allowing ARSEC to monitor expenditures while constantly updating actual expenditures cost to completion and scheduling forecasts. ARSEC's MIS can provide USACE with extremely detailed invoices, grouping costs into a customized format based on labor categories, task WBS elements, or funding sources. The approved baseline schedule is used as the comparative basis to calculate budgeted cost of work scheduled (BCWS), budgeted cost of work performed (BCWP), actual cost of work performed (ACWP), schedule performance index (SPI), and cost performance index (CPI). These indicators allow the project manager to identify and examine variances from the project baseline schedule, plan and execute corrective action(s) as necessary to minimize the impact, and achieve the baseline schedule goals.

ARSEC's MIS Meets USACE Requirements for Effective Management

- Our schedulers list project activities in a logical sequence and include realistic duration for each activity to develop a CPM Network Diagram
- We require subcontractors and vendors to confirm the duration and sequences for their activities for incorporation into the schedule
- Project milestones are established with definable endpoints to support cost control
- Schedules are cost and resource loaded to identify budgetary and resource allocation problems in advance
- Our project management staff update schedules on a weekly basis
- Schedules are used as a tool for daily planning, look-ahead planning, historical record and resource planning
- Costs can be tracked on a task order against different funding sources

Primavera Cost Manager® is an earned value reporting system that evaluates cost and schedule data to produce variance reports, updated cost to completion estimates, and other pertinent metrics to measure performance. It is uniquely configured to gather, analyze, and distribute information that measures the physical accomplishment of work on a project against the approved plan and its associated cost as compared to the approved budget. This information is used to determine project status by analyzing cost, schedule, and technical performance while considering potential problems and alternative action plans. Additionally, the Tonawanda Landfill Operable Unit project manager can determine where cost savings may be realized based on comparison of project status against forecasted schedule.

For Firm Fixed Price contracts like the Delivery Order for the Tonawanda Landfill Operable Unit Project, ARSEC will provide the following:

- Written Weekly Progress Reports,
- Monthly Payment Requests, and
- Monthly Accrual Information.

Weekly Progress Reports: The development and submittal of written weekly progress reports shall be submitted to the COR by Close of Business on Monday of each week. This weekly report shall include a summary of work performed, safety issues, quality issues, and an updated schedule.

Payment Requests: The development of payment requests shall be on a monthly basis and will be progressed based. The ARSEC Site Manager and/or Project Manager shall develop the monthly proposed progress with the COR prior to submitting the invoice.

Accruals: By the 25th of each month, ARSEC will submit accrual information to the COR in accordance with the requirements of Section 7.3 of the SOW.

7.0 COST ESTIMATE CONTROL AND REPORTING

SCHEDULING, COST CONTROL AND PERFORMANCE STATUS REPORTING

The Project Team will use *MAS200*, *S2 Project Accounting*, *Timberline* estimating software, *Primavera P5* scheduling software, and *Primavera's Cost Manager* earned value reporting software. ARSEC's integrated *MAS200/S2* software to forecast cost to completion and schedule daily updates for the project lifecycle. Figure 7-1 shows the integration and flow of information throughout ARSEC's MIS in relationship to the USACE Resident Management System (RMS), even though this project is not required to utilize the USACE RMS for daily reporting.

The MIS is structured to provide the Project Manager and staff the best available method to enter data, track costs, and generate reports to manage reimbursable TOs such as the Tonawanda Landfill Operable Unit project that may change over the life-cycle of the contract. In addition, the system is configured to generate customized regulatory and technical progress reports to the COR, records of corrective actions or other project issues, and "estimates to complete" throughout project duration.

ARSEC's MIS was designed and is implemented on the project-level to satisfy a set of shared ARSEC and USACE objectives regarding the effectiveness and efficiency with which TOs are managed.

Schedule Reporting: ARSEC utilizes *P6* scheduling software to time phase resources and activities and to perform a wide variety of schedule analysis for cost reimbursable contracts. This integrated software allows the Project Manager and other team members to update progress, analyze resource utilization, and review budgeted cost information, which will aid in effectively tracking and managing the Tonawanda Landfill Operable Unit project TO. The Project Manager, with the project scheduler, will oversee the input of the WBS into the initial project schedule in *P5* and will update the schedule status throughout the performance of the TO. The *P5* resource loaded schedule is integrated directly to the *MAS200/S2* financial system via the *Primavera Cost Manager*® software program. The integrated program enables the Project Manager to access timely and accurate cost, man-hour, and progress information for each element of the Tonawanda Landfill Operable Unit project as defined on the schedule. Furthermore, the cost-loaded schedule is uploaded to the USACE QMS and the RMS via standard data exchange format, allowing a seamless integration with USACE information management systems.

Cost Control and Performance Status Reporting: Weekly project planning is the most crucial aspect to achieving schedule and budget compliance during project execution of cost-reimbursable contracts. The previous week's work is reviewed and evaluated to ensure it has been performed according to specifications, within budget and completed within the scheduled time frame. Corrective actions are prescribed and implemented for any deviations from quality, cost or schedule identified. Look Ahead Reports are also reviewed from quality, cost and schedule standpoints, to ensure the team has identified the appropriate specifications and technical requirements. Additionally, the resources and schedule budgeted for these activities are reviewed so the project team understands these constraints.

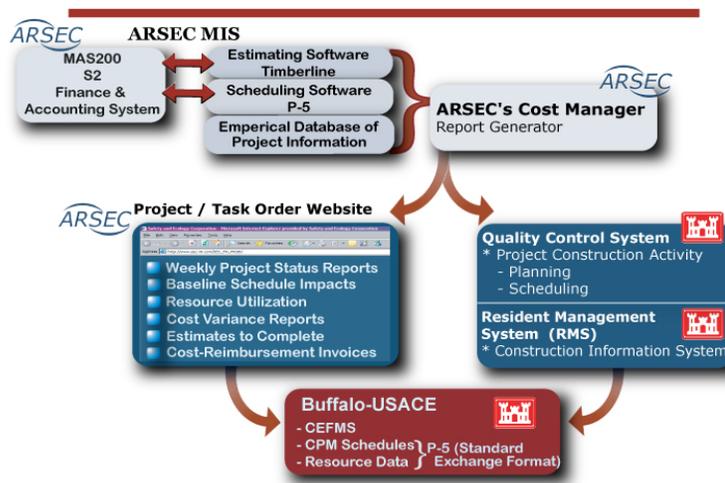


Figure 7-1. Electronic Integration of Project Status, Scheduling, and Performance Allows the Buffalo-USACE Real-Time Status and Clear Communication

8.0 COMMUNICATIONS

Communication within each project team and support personnel is critical to the success of this project and is recognized by the ARSEC Team as a function that involves considerable risk if communication channels are not formalized and defined prior to project start. The PM is responsible for integrating our management approach for this contract.

The PM directs the field effort through constant communication with the technicians in addition to interaction directly with support personnel from QC, ES&H, Project Controls, and Engineering to integrate these functions into all phases of the project. To ensure operational independence, the CQCSM and S&H representative report directly to the ARSEC President. Table 8-1 describes various meetings that will be held to foster communication within the team and between the team and USACE.

Table 8-1. Frequent Intra- and Inter-team Meetings Will Foster Communication

Meeting	Frequency	Lead	Participants*	Purpose
POD/Tailgate Safety	Daily (at work start)	PM and ES&H	All on-site staff & subs	<ul style="list-style-type: none"> Review planned activities Solicit worker feedback Hazard mitigation Lessons learned
Status Review	Daily (at work end)	PM	Management Staff	<ul style="list-style-type: none"> Review day's activities Determine next day's activities Update cost and schedule info
Internal Progress	Weekly	PM	Management Staff	<ul style="list-style-type: none"> Review cost and schedule Make necessary adjustments
Progress	Weekly	PM	USACE	<ul style="list-style-type: none"> Status report Address issues/concerns Solicit feedback from USACE
Corporate Review	Monthly	PM	CEO, Corporate CQCM, ES&H Manager	<ul style="list-style-type: none"> Cost and schedule update Management assessment Review QC and ES&H issues

**USACE is invited to attend any/all meetings*

The PM communicates daily with project team staff through the daily toolbox meetings and the COR to discuss overall performance, technical issues, safety concerns and goals for that day. In addition, the PM will serve as ARSEC Team's authorized supervisor for technical and administrative performance as well as the single POC between the ARSEC Team and the COR in the field.

Weekly project planning is the most crucial aspect to achieving schedule and budget compliance during project execution where the PM and COR convene with appropriate project technical and support personnel and subcontractors to evaluate project schedule progress and budget information. The previous week's work is reviewed and evaluated to ensure it has been performed according to specifications, within budget and completed within the scheduled time frame. Corrective actions are prescribed and implemented for any deviations from quality, cost or schedule identified. Upcoming activities are also reviewed from quality, cost and schedule standpoints, to ensure the team has identified the appropriate specifications and technical requirements. Additionally, the resources and schedule budgeted for these activities are reviewed so the project team understands these constraints.

9.0 PROJECT TEAM

Table 9-1 on the following page represents ARSEC's key team members, their level of knowledge, experience, and professional standing, who will support the Tonawanda Landfill Operable Unit project.

Table 9-1. Summary Chart of Key Personnel Qualifications/Certifications		Individual Years of Experience Relative to the Scope of Work																									TOs Performed							
		Radioactive Materials														Studies and Evaluations				Field Activities				Surveys/Mapping										
		Rad Testing/Technology	MARSSIM Surveys	Site Closeout Procedures	Final Status Survey	HTRW Waste Management	Rad Modeling	CQM	Data Management	Env. Regulatory Compliance	ES&H	Decontamination and Decommissioning Procedures	Env. Monitoring Systems	Dose/Risk Assessments	Env./Eco. Assessments	DCGLs	Environmental Permitting	GPS/GIS	Env. Media Sampling	HTRW Sampling	Radiological Release Surveys	Topographic Surveys	Monitoring/Baseline Surveys	Cost Reimbursable Contracts	Fixed Price Contracts									
Key Personnel	Prime (P) or Sub (S)	Total Years	In Proposed Position	With ARSEC	With FUSRAP	With Superfund	With HTW	With Rad	With USACE	With Other (Fed)																								
Project Manager MBA, BS Chem. Engr.	P	30	18	2	10	28	25	12	15	25	25	3		8	-	25	4	25	25	25	13	25	8	8	8	-	-	13	25	25	13	25	>25	>25
Principal/PM BS OSHT: NRRPT NELAP <NY, PA>	P	21	15	13	3	10	20	21	9	15	15	9	5	9	15	9	-	15	15	15	15	15	15	15	10	9	15	10	15	15	10	13	>25	>25
Corporate CQCM BS, Metallurgical Engineering Technology	P	25	15	1	3	3	8	20	3	3	8	2	5	2	17	2	2.5	14	17	17	20	14	-	-	-	-	-	14	14	3	-	-	10	10
CQCSM CQM	P	27	3	2	12	15	15	15	-	12	-	-	15	15	15	15	15	15	20	25	25	25	15	10	10	17	10	25	15	20	-	-	>10	>10
Project Geologist MS/BS Geology	P	19	19	6	10	19	19	19	5	19	-	6	19	6	19	-	5	19	19	15	19	19	-	19	-	19	10	19	19	-	-	19	>10	>10
Andy Lombardo Project CHP Radiation Health NRRPT	P	27	20	2	6	8	8	27	-	25	25	9	10	10	-	25	4	25	25	25	10	25	15	8	8	-	2	7	25	25	7	25	>25	>25
Site RSO	P	27	23	16	2	5	17	27	-	27	27	8	15	15	20	25	15	27	27	27	25	25	16	24	8	16	5	26	26	26	-	16	3	>25
QMS SSHO and Site Superintendent	P	13	13	1	-	13	13	1	9	13	-	-	13	-	13	-	9	8	13	13	-	13	-	9	-	8	-	13	13	-	20	13	16	>25

10.0 INDEPENDENT TECHNICAL REVIEW

ARSEC will conduct an Independent Technical Review (ITR) of the Tonawanda Landfill Operable Unit Project consistent with USACE ER-1110-1-12, *Quality Management* and in accordance with ARSEC-Q-22, *Independent Technical Review*. Reviews will be identified in the project schedule and assigned to personnel not involved in the day-to-day production of a project/product.

An ITR will be established for a project/product based on the scope, complexity, risk and cost of the project/product. The primary objectives of the ITR will be to ensure:

- The project meets the customer's scope, intent and quality objectives.
- Formulation and evaluation of alternatives are consistent with applicable regulations and guidance.
- Concepts and project costs are valid.
- Relevant engineering and scientific disciplines have been effectively integrated.
- Appropriate computer models and methods of analysis were used and basic assumptions are valid and used for the intended purpose.
- The source, amount, and level of detail of the data used in the analysis are appropriate for the complexity of the project.
- The project complies with USACE and ARSEC accepted practices.
- Content is sufficiently complete for the applicable phase of the project.
- Project documentation is appropriate and adequate for the project phase.

ARSEC-Q-22 includes requirements for ITR team membership, ITR team and project team relationship, informal in-process reviews, formal final reviews, and the process for disposition of review comments. Upon completion of each review, the ITR leader will complete a statement of technical review for final products and documents. The certification will attest to compliant resolution of all issues raised by the ITR team.

A typical detailed ITR Checklist can be found on the next page.

ITR Checklist

Project Number:		ITR Number:	
Applicable Definable Feature of Work:			Schedule ID:
Submittal? Y <input type="checkbox"/> N <input type="checkbox"/> : If yes, title:		In-Process Review <input type="checkbox"/>	Final Review <input type="checkbox"/>
ITR Team Leader: Indicate whether the criterion was met by checking Yes or No. If the criterion is not met, note in Remarks/Issues section.			
Review Criteria:	Results of Review	Initial of ITR Lead	Date Reviewed
1. Project or product meets customer’s scope, intent, and quality objectives.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>		
2. Formulation or evaluation of alternatives is consistent with applicable regulations and guidance.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>		
3. Concepts and project costs are valid.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>		
4. Relevant engineering and scientific disciplines have been effectively integrated.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>		
5. Computer models and methods of analysis were used and basic assumptions were valid and used for the intended purpose.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>		
6. Source, amount, and level of detail of the data used in the analysis were appropriate for the complexity of the project.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>		
7. The project or product complies with USACE/ARSEC approved SOPs.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>		
8. Content is sufficiently complete for the applicable project phase.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>		
9. Project documentation is appropriate and adequate for the project phase.	Y <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>		
Remarks/Issues:			
I certify that this independent technical review was conducted in accordance with ARSEC-Q-22, <i>Independent Technical Review</i> , and USACE approved practices. Resolution of identified issues has been achieved and documented accordingly.			
ITR Lead:	Signature:	Date:	
Project Manager:	Signature:	Date:	

11.0 Project Risks

ARSEC recognizes that the Tonawanda Site's contaminants of concern (e.g., VOCs, pesticides, PAHs, and radionuclides) have special concerns with regard to worker exposure. See Table 11-1 for Tonawanda project risks. ARSEC provides the best employee protection available with regard to contaminants by applying innovative programs that protect employees, from administrative policies to the deployment of cutting edge personal protection equipment, as necessary. Further, employees that work in environments that present the potential for exposure to hazardous materials receive medical surveillance many times above what is required, such as Beryllium Lymphocyte Proliferation Exams, to provide the most protective working environments to our employees and all involved with project execution.

Table 11-1. Tonawanda Project Risks

Exposure - VOCs	Bore drilling and associated movement of track drill	Investigative derived waste drumming activities	Exposure - pesticides	Risks identified during the conduct of the initial Visual Site Inspection
Exposure - PAHs	On-site transportation of waste drums and canisters	Niagara Mohawk Power Corp. power transmission lines and poles / towers	Underground pipelines	Trimming and cutting vegetation
Exposure - radionuclides	Cutting / tearing used PPE to render unusable	Vegetation chipping		

ARSEC has prepared a comprehensive Accident Prevention Plan / Site Safety and Health Plan (APP/SSHP) that addresses all safety plans/protocols/procedures that will be employed to ensure that potential risks are addressed and the work is conducted with Zero Accidents. A Radiation Safety Plan (RSP) is included as an attachment to the APP/SSHP. The APP/SSHP contains Activity Hazard Assessments (AHAs) for each planned work activity. The APP/SSHP also includes air monitoring plans, fugitive dust suppression procedures, noise monitoring, and decontamination procedures for the site. The APP/SSHP includes requirements for the Daily Tailgate Safety Meeting and delineates the ARSEC Hazardous Work Permit/Radiation Work Permit protocols and procedures. All of the safety documentation prepared for the Tonawanda Landfill Project is prepared in accordance with EM 385-1-1 and other pertinent regulations/guidance documents such as ER 385-1-92, UFGS-01 35 26, UFGS-01 35 29.13, OSHA 29 CFR 1926, OSHA 29 CFR 1910, OSHA 1910.120 and/or 1926.65, EM 385-1-80, 10 CFR Part 20, RCRA Subtitle C, and OAC 3701.

Emerging risks or anomalous conditions will be managed through the ARSEC Issue Management Procedure (ARSEC-Q-15). This procedure requires investigation and research of an issue until it is fully understood and sufficient corrective action is in place. Corrective actions are monitored and continually evaluated until the issue has been resolved.

Other Risks

Submittal delay – ARSEC recognizes that the development, review and acceptance of project submittals are a significant risk to the overall project schedule. Delays in the development and submittal of pre-mobilization submittals will impact the mobilization schedule and require that field operational approaches be modified to maintain the ability to complete the project within the allotted timeframe. Similarly, delays in the development of the Final Project Report will impact the final completion of the project. ARSEC PM, with the support of corporate management of ARSEC member companies, will task project and non-project staff to develop and submit the required submittals. If delays are incurred,

additional resources and/or extended work hours/work weeks will be applied in an attempt to restore schedule compliance. Should the delay not be fully recoverable, ARSEC will work with the project team, including our drilling subcontractors and laboratories, to add additional resources (e.g., more personnel, more equipment, etc.) to shorten the field investigation phase of the project.

Insufficient Technical/Field Resources – ARSEC member firms have approximately 600 technical and field personnel that can be applied to support the Tonawanda Project. Both firms have committed technical and field resources to support the Tonawanda Project and will continually monitor the implementation schedule and add additional personnel, as necessary, to effectively and efficiently manage the project. If required, ARSEC will utilize pre-arranged contracts with technical and field staff augmentation firms to provide additional resources.

Equipment Failures – ARSEC recognizes that equipment failure could impact the performance schedule for the Tonawanda Project. Required equipment includes radiological instrumentation, clearing and grubbing equipment, drilling equipment, and other miscellaneous equipment. If the mobilized radiological monitoring equipment fails, the ARSEC Site RSO will attempt to repair the equipment onsite and/or contact the SEC Instrumentation Shop, a national supplier of radiological and environmental monitoring equipment, and request replacement instrumentation be shipped to the Tonawanda Site on a priority basis. All clearing and grubbing equipment to be used onsite at Tonawanda will be obtained from local equipment rental agents. Each piece of equipment will be inspected daily for operability and required maintenance. If a piece of rental equipment fails, the ARSEC Site Superintendent will contact the local agents and have the equipment repaired or replaced. If there is a failure of the drilling equipment, Zebra Environmental has committed to mobilizing replacement equipment from one of its regional offices to replace the failed equipment. Other equipment failures will be addressed on a case-by-case basis by the ARSEC Site Superintendent and PM.

Weather Impacts – ARSEC will accommodate weather impacts and delays by working extended hours and work weeks. ARSEC and its drilling subcontractor will also commit to mobilizing additional equipment and personnel to the Tonawanda Site, as necessary to maintain the project's required completion milestone.