

**DRAFT FINAL
WORK PLAN**

TECHNICAL ASSISTANCE

**CENTREDALE MANOR
NORTH PROVIDENCE, RHODE ISLAND**

RESPONSE ACTION CONTRACT (RAC), REGION I

**For
U.S. Environmental Protection Agency**

**By
Tetra Tech NUS, Inc.**

**EPA Contract No. 68-W6-0045
EPA Work Assignment No. 043-ANLA-016P
TtNUS Project No. N0400**

October 1999



TETRA TECH NUS, INC.

5672

DRAFT FINAL
WORK PLAN

TECHNICAL ASSISTANCE

CENTREDALE MANOR
NORTH PROVIDENCE, RHODE ISLAND

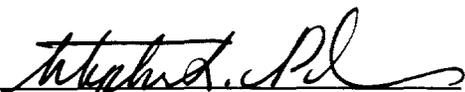
RESPONSE ACTION CONTRACT (RAC), REGION I

For
U.S. Environmental Protection Agency

By
Tetra Tech NUS, Inc.

EPA Contract No. 68-W6-0045
EPA Work Assignment No. 043-ANLA-016P
TtNUS Project No. N0400

October 1999


Stephen S. Parker
Project Manager


George J. Gardner, P.E.
Program Manager

**TABLE OF CONTENTS
DRAFT FINAL WORK PLAN
TECHNICAL ASSISTANCE
CENTREDALE MANOR
NORTH PROVIDENCE, RHODE ISLAND**

<u>SECTION</u>	<u>PAGE</u>
1.0 INTRODUCTION	1-1
1.1 Work Assignment Objective	1-1
1.2 Work Plan Organization	1-1
2.0 SITE DESCRIPTION	2-1
2.1 Centredale Manor (Metro Atlantic Chemical)	2-1
2.2 Woonasquatucket River Study Area	2-3
3.0 SCOPE OF WORK	3-1
4.0 TASK PLAN DESCRIPTION	4-1
4.1 Task 0100 - Project Planning and Support	4-1
4.1.1 Subtask 0111 – Attend Scoping Meeting	4-1
4.1.2 Subtask 0112 – Conduct Site Visit	4-1
4.1.3 Subtask 0113 – Evaluate Existing Information	4-1
4.1.4 Subtask 0114 - Develop Project Goals and Objectives	4-2
4.1.5 Subtask 0115 – Develop Work Plan	4-3
4.1.6 Subtask 0120 - Site Management Plan	4-4
4.1.7 Subtask 0130 - Project Management	4-6
4.1.8 Subtask 0140 – Subcontract Procurement and Support	4-7
4.2 Task 0200 – Environmental Sampling	4-7
4.2.1 Subtask 0210 – Mobilization/Demobilization	4-9
4.2.2 Subtask 0220 - Residential Soil Sampling	4-9
4.2.3 Subtask 0230 - Bank (Recreational) Sediment/Soil Sampling	4-10
4.2.4 Subtask 0240 - Sediment/Surface Water Sampling	4-12
4.2.5 Subtask 0250 - Depth Sampling	4-12
4.3 Task 0300 – Sample Analysis	4-13
4.4 Task 0400 – Analytical Support	4-14
4.5 Task 0500 – Data Validation	4-14
4.6 Task 0600 – Data Evaluation and Reporting	4-15
4.6.1 Subtask 0610 – Data Usability Evaluation	4-15
4.6.2 Subtask 0620 – Data Reduction, Tabulation, and Evaluation	4-15
4.6.3 Subtasks 0630 and 0640 – Data Trend Evaluation and Submission of Technical Memorandum	4-17
4.7 Task 0700 – Characterization and Disposal of IDW	4-17

**TABLE OF CONTENTS
DRAFT FINAL WORK PLAN
TECHNICAL ASSISTANCE
CENTREDALE MANOR
NORTH PROVIDENCE, RHODE ISLAND**

<u>SECTION</u>	<u>PAGE</u>
4.8 Task 0800 – Work Assignment Closeout	4-17
4.8.1 Return Documents to Government	4-18
4.8.2 File Duplication/Distribution/Storage	4-18
4.8.3 File Archiving.....	4-18
4.8.4 Prepare Closeout Report.....	4-18
5.0 PROJECT MANAGEMENT	5-1
5.1 Project Organization	5-1
5.2 Quality Assurance and Data Management	5-1
5.3 Project Schedule.....	5-1
5.4 Project Cost	5-4
6.0 EQUIPMENT AND SUPPLIES	6-1

TABLES

<u>NUMBER</u>	<u>PAGE</u>
4-1 Proposed Sample Collection Summary.....	4-8

FIGURES

<u>NUMBER</u>	<u>PAGE</u>
2-1 Site Locus Figure	2-2
2-2 Study Area Detail Woonasquatucket River.....	2-4
5-1 Project Organization	5-2
5-2 Proposed Schedule.....	5-3

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) Region I requested that Tetra Tech NUS, Inc. (TtNUS) provide Technical Assistance (TA) support for the Centredale Manor Site located in North Providence, Rhode Island. The TA support would be performed under Contract No. 68-W6-0045, Work Assignment No. 043-ANLA-O16P. This Work Plan describes the scope of work and proposed schedule for providing technical support activities for surface water, sediment and soil sample collection and analysis in the Woonasquatucket River and wetlands associated with the site. The Work Plan was developed based on EPA Work Assignment Form (WAF), Revision No. 0 (dated July 21, 1999) and the associated Statement of Work and results of the August 4, 1999 scoping meeting between EPA and TtNUS.

1.1 Work Assignment Objective

The objective of this work assignment is to provide technical assistance to EPA by performance of a study on the extent of sediment contamination in the Woonasquatucket River and wetlands associated to the Centredale Manor Site. The data results will be submitted to EPA in a Technical Memorandum and will be used by the EPA for ecological and human health risk assessment and other engineering evaluations.

TtNUS will collect, compile, and evaluate analytical and site data, develop data tables, and provide a report of activity and data collected under this work assignment. In addition, TtNUS will compile data collected under previous investigations for the site into a database for future data evaluation purposes.

1.2 Work Plan Organization

This Draft Final Work Plan contains six sections: the Introduction is presented in Section 1.0; Section 2.0 identifies the site description and the environmental contamination problems; Section 3.0 presents the scope of work; Section 4.0 presents the

detailed task descriptions; Section 5.0 presents a proposed project management approach and projected schedule; and Section 6.0 identifies the equipment and consumable supplies necessary to perform the activities identified in this Draft Final Work Plan.

2.0 SITE DESCRIPTION

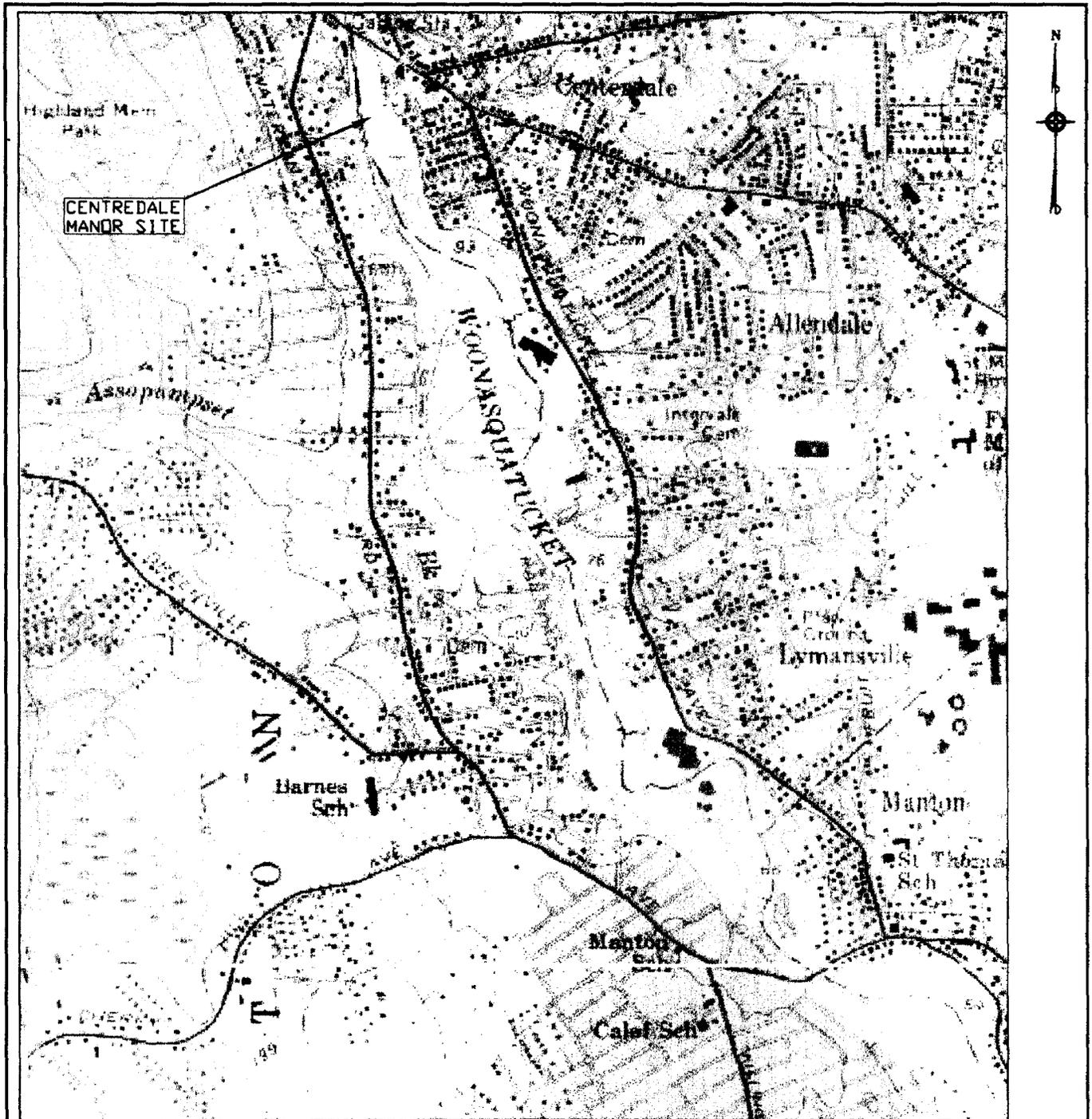
This section presents a description of the Centredale Manor site and the Woonasquatucket River proposed study area. This information is presented as a basis for development of the proposed study, described in Sections 3 and 4 of this Work Plan.

2.1 Centredale Manor (Metro Atlantic Chemical)

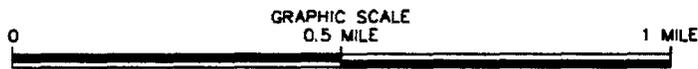
The Centredale Manor is a multi-unit apartment complex that houses elderly and handicapped adults. It is located at 2074 Smith Street (Route 44) in Centredale, a village of North Providence Rhode Island. Figure 2-1 presents the location of the site. This building, as well as, the adjacent apartment building known as "Brook Village", is located on the site of the former Metro-Atlantic Chemical Corporation, which occupied a mill complex on the site from the 1940s to the 1970s. The Woonasquatucket River follows the west boundary of the site, and there is the remains of a raceway for the mill complex on the eastern boundary of the site.

Historical records of Metro Atlantic Chemical indicate that hexachlorophene was manufactured on site, and there were shipments of trichlorophenols to the site. The mill complex was destroyed by fire in the late 1970s, and the apartment buildings were constructed in 1982. During construction of the apartment buildings, 400 drums and 6000 cubic yards of soil were removed from the site. Drum labels indicated that caustics, halogenated solvents, polychlorinated biphenyls (PCBs), and inks may have been contained in the drums.

Elevated levels of dioxin were discovered in fish in June 1996, by a study conducted by EPA Narragansett Laboratories and the Providence Urban Initiative program. Consequently, a study conducted by the USEPA of the Woonasquatucket River (July 1998) found elevated concentrations of dioxin and PCBs in sediments in portions of the river and impoundments. Soil and sediment sampling conducted in September 1998, found dioxin present at concentrations above 1 ppb in portions of the river and in Allendale Pond,



BASEMAP: PORTION OF THE FOLLOWING U.S.G.S. QUADRANGLE MAP: PROVIDENCE, RI, 1957, PHOTOREVISED 1970 AND 1975.



QUADRANGLE LOCATION

SITE LOCUS FIGURE		FIGURE 2-1	
CENTREDALE MANOR			
PROVIDENCE, RHODE ISLAND			
DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	S. PARKER	DATE:	OCTOBER 14, 1999
SCALE:	AS NOTED	ACAD NAME:	DWG\CENTREDALE\USGS.DWG



TETRA TECH NUS, INC.

55 Jonspin Road
Wilmington, MA 01887
(978)658-7899

the first impoundment to the south (downstream) of the site. Further sampling conducted in February 1999, on the property of the Centredale Manor, also found elevated concentrations of dioxin in soils and sediment. Additional historical information is available in the Expanded Site Inspection report, prepared for the site by R.F. Weston (March 9, 1999).

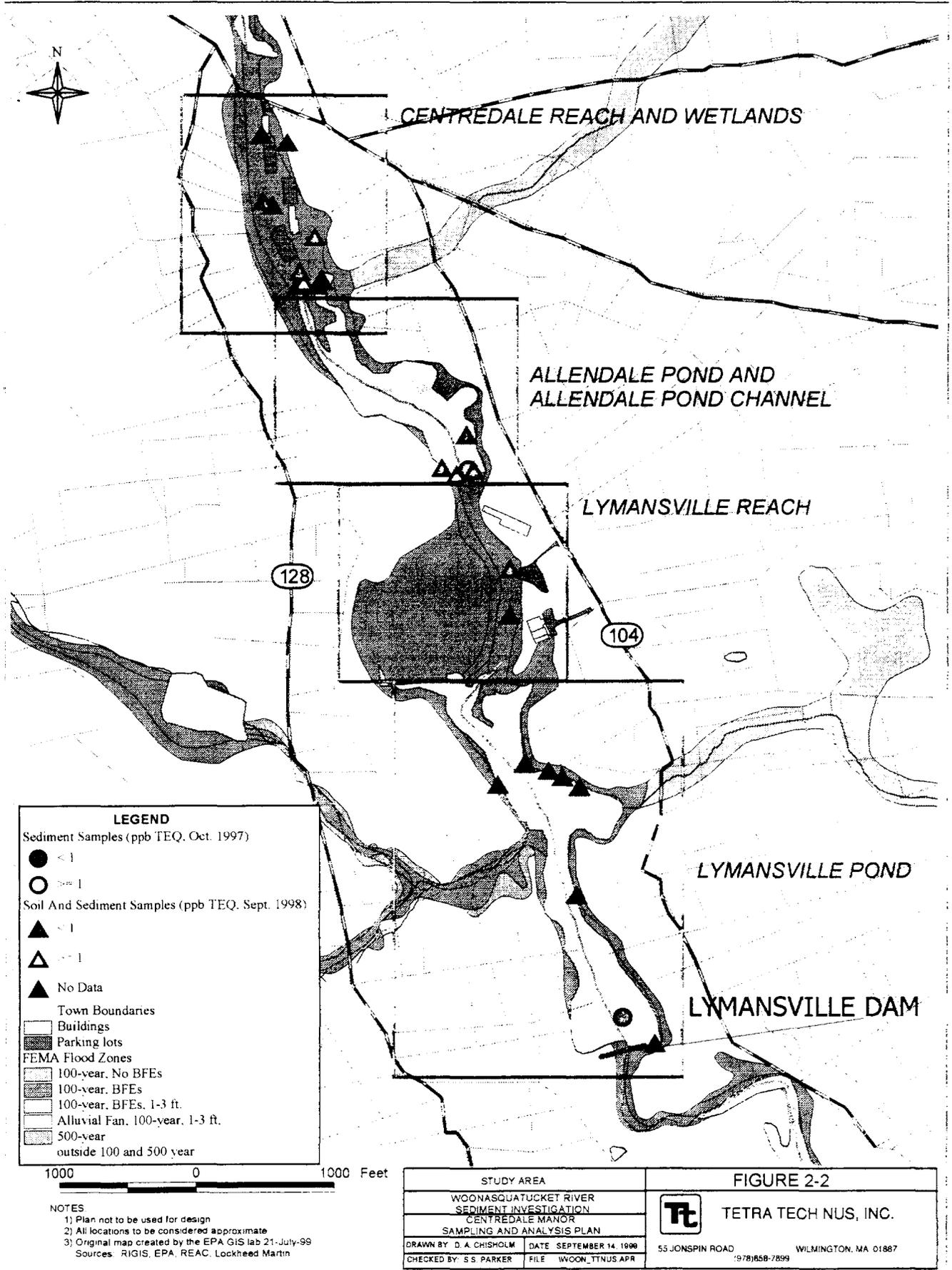
Currently, USEPA Emergency and Rapid Response Service Region I (ERRS-I) is conducting an evaluation of the Centredale Manor and Brook Village properties for possible source control actions. Part of this evaluation is an extensive sampling program for soils and sediment from the occupied portions of the Centredale Manor and flood-plain wetlands to the south. This sampling action is anticipated to be completed by August 30, 1999. However, the ERRS-I program does not include river sediment and does not extend beyond the former property of Metro Atlantic.

2.2 Woonasquatucket River Study Area

The purpose of this work assignment is to conduct additional sampling in areas that may have been impacted by contaminants transported by the Woonasquatucket River waters, and to possibly identify the extent of contamination of the river system resulting from releases at the former Metro-Atlantic Chemical property. As stated in Section 1.1, this data will be used for risk assessment and engineering evaluations.

For the purposes of this work assignment, specific areas of the Woonasquatucket River and associated wetlands have been identified as areas of concern and will be investigated. Primary areas of concern are reaches of the river system that have previously been found to contain dioxin in sediment at concentrations in excess of 1 ppb. These areas are identified as follows, and are presented on Figure 2-2:

- Woonasquatucket River, Centredale Reach
- Centredale Wetlands



- Allendale Pond Channel
- Allendale Pond Bottoms (exposed by failure of the Allendale Dam)
- Woonasquatucket River, Lymansville Reach

In addition, the area immediately downstream of the primary areas of concern is a large impoundment that serves as a settling basin for sediments, and therefore has the potential to act as a trap for contaminated sediments. Although dioxin has not previously been found in sediments of this pond at concentrations exceeding 1 ppb, this impoundment is included in the study area as a secondary area of concern:

- Lymansville Pond

Four upgradient areas have been identified as potential reference areas for comparison of contaminants in river and wetland sediments. These include the following:

- Woonasquatucket River (Upstream Reach)
- Centredale Brook
- Assapumpsett Brook
- Cranberry Brook

Additional information on these areas and their basis for selection will be provided in the proposed sampling plans as appropriate.

3.0 SCOPE OF WORK

The Scope of Work for this Work Plan is to perform surface water, sediment, and soil sampling in the Woonasquatucket River for contaminants associated with the Centredale Manor property. Data will be used by EPA for risk assessment and other evaluations.

The Scope of Work for this Work Plan includes the following activities and is based on the EPA Scope of Work (July 21, 1999), the scoping meeting held August 4, 1999, and the site visit and data management meeting held August 11, 1999:

- Attend scoping meeting and develop project goals and objectives.
- Conduct a site visit with the EPA Remedial Project Manager (RPM).
- Prepare a work plan and cost estimate.
- Review available information, including ERRS I and ERTC work/QA plans.
- Prepare Site Management Plans – Sampling and Analysis and Health and Safety Plan.
- Conduct project procurement activities.
- Perform project management and monthly reporting activities.
- Attend technical and project meetings at EPA offices.
- Procure and oversee analytical subcontractors.
- Mobilize and demobilize staff and equipment to site.

- Collect and analyze soil, sediment and surface water samples for specified contaminant sets.
- Dispose of investigation-derived waste.
- Perform global positioning survey of each sample station.
- Organize, reduce, and tabulate existing analytical data; develop appropriate databases.
- Compile new data into database, provide revisions to USEPA as necessary.
- Prepare technical memorandum describing the sampling activities and the data collected.
- Close out work assignment at completion.

4.0 TASK PLAN DESCRIPTION

This section provides the details of the tasks to be performed by TtNUS to meet the requirements of the EPA Statement of Work and as discussed with the EPA RPM.

4.1 Task 0100 - Project Planning and Support

This task encompasses all necessary activities to plan, execute, and manage the tasks specified in the EPA Statement of Work. Five subtasks comprise project planning and are presented below.

4.1.1 Subtask 0111 - Attend Scoping Meeting

A scoping meeting between the EPA Project Officer, Contracting Officer, RPM, and other technical staff and TtNUS Deputy Program Manager, Lead Chemist, and work assignment project manager was held on August 4, 1999 at USEPA in Boston. Additional information was provided by EPA during the meeting to clarify the activities to be performed.

4.1.2 Subtask 0112 - Conduct Site Visit

TtNUS technical staff conducted a visit to the Centredale Manor property and the areas of interest of the Woonasquatucket River so that TtNUS could develop a better conceptual understanding of the site location and topography, the contamination issues, contaminant migration pathways etc. On the same date, a brief meeting was held to discuss the transfer of data from ERRS-I and ERTC to EPA and TtNUS.

4.1.3 Subtask 0113 - Evaluate Existing Information

TtNUS has obtained from EPA (as identified in SOW Revision 0) and will review the following available documents pertaining to the site:

- Woonasquatucket River Sediment/Water Quality Analysis Project Report (USEPA, 7/31/98).
- Final Summary Report for Expanded Site Inspection, Centredale Manor Site. (R.F. Weston, 3/9/99)
- Responsive Documents A-G of Information Request Answers (GZA, 4/14/99)
- Quality Assurance Project Plan and HASP, Centredale Manor Site (IT Corp, 6/8/99)
- Trip Report, Soil Sampling February 1999, Centredale Manor (Woonasquatucket River) (R.F. Weston, 3/12/99)
- Records from Subsurface Investigation, Brook Village Property (GEC, 2/23/99)
- Other available background information for the site as provided by the RPM

These documents will be reviewed by TtNUS to preliminarily identify site features and conditions, potential contaminant presence and migration, and receptors that may result in the need for a non-time-critical removal action.

4.1.4 Subtask 0114 - Develop Project Goals and Objectives

TtNUS will prepare data needs and data quality objectives for analytical sampling to be performed. The goals and objectives will be used to define the analytical methods and protocols, decontamination procedures, and reporting levels required to satisfy EPA Region I guidelines. The outcome of this effort will be based on the information provided by TtNUS at the scoping meeting, the site walk, and in the background documents identified in Section 4.1.3.

4.1.5 Subtask 0115 - Develop Work Plan

TtNUS will prepare and submit a Draft Work Plan and if required, a Draft Final Work Plan. The Draft Work Plan includes a description of project tasks, the procedures to accomplish them, and a proposed project schedule. Specifically, the Work Plan will include the following:

- A detailed identification of project elements and associated tasks (and subtasks) that conform to the Work Breakdown Structure (WBS) tasks and sequence specified in the SOW.
- TtNUS' technical approach to perform each task, including a description of each task, the assumptions used, the information needed for each task, any information to be produced during and at the conclusion of each task, and a description of the work products that will be submitted to EPA.
- A schedule that provides specific dates (or assumed if this information is unavailable) for completion of each required activity and submission of each deliverable required by this SOW.

A Cost Estimate will be prepared as a separate document, including the estimated cost to complete the work by Level of Effort (by P levels) and dollar cost for each task of the WBS.

Under this effort, TtNUS will attend a negotiation meeting, at which additional information will (if necessary) be provided to describe the basis of the cost estimates.

TtNUS will prepare a Draft Final Work Plan after receipt of EPA comments. This Draft Final version will incorporate comments on the draft version as directed by EPA and will reflect revisions as agreed to at the negotiations meeting.

4.1.6 Subtask 0120 - Site Management Plan

This subtask includes preparing the site management plan using the most recent version of the equivalent plans for the site prepared by IT Corp, R.F. Weston, and others, as appropriate, and after reviewing and evaluating existing data and maps for the study area. The Sampling and Analysis Plan will include the Quality Assurance Project Plan and the Site Management Plan/Field Sampling Plan. The Health and Safety Plan (HASP) will be presented as an appendix to the Sampling and Analysis Plan.

Sampling and Analysis Plan (SAP)

The SAP will serve as the overall document describing the work to be undertaken at the site. The SAP is a combination of the Quality Assurance Project Plan and the Site Management/Field Sampling Plan. This will allow all site-relevant data to be included in one document, which will be convenient for the field crew, project managers, and on-site project visitors. The selected boring locations will be presented on a figure in the SAP based on an evaluation of existing data. Sampling intervals specific to each data need are identified in the SOW.

The SAP will also include the following information:

- The plan and basis for collection of analytical data.
- A brief evaluation of sediment transport mechanisms to support selection of sample stations.
- Identification of residential properties that lie within the 100-year flood zone abutting the study area.
- The data management requirements for project management systems, including tracking, storing, and retrieving data. Data management includes identifying the

software to be used, minimum data requirements, a standardized data format; and managing backup data. Analytical data and characteristic data will be provided to EPA in an electronic format that is compatible with the site Data Management System.

- The procedures for managing and disposing of Investigation-Derived Wastes (IDW).

Other site control documents will be prepared and incorporated in the Sampling and Analysis Plan. These include the Quality Assurance Project Plan, the Field Sampling Plan, the Site Management Plan, and the Health and Safety Plan. These are described below.

Quality Assurance Project Plan (QAPP)

The Quality Assurance Project Plan, presented as a subsection of the SAP, discusses the project objectives and organization, functional activities, and quality assurance/quality control (QA/QC) protocols that will be used to achieve the desired data quality objectives (DQOs). The DQOs, at a minimum, reflect use of analytical methods for identifying contamination and addressing contamination, consistent with the levels for remedial action objectives identified in the National Contingency Plan. This subtask includes preparing data needs and DQOs for the analytical sampling to be performed during the field investigation. The goals and objectives of the field investigation will define the analytical methods and protocols.

Field Sampling Plan (FSP)

The Field Sampling Plan, presented as a subsection of the SAP, will include the sampling and analytical objectives; the number, type, and location of all samples to be collected; sample handling and analysis; site-specific QA requirements; field activity procedures; and data management elements. The FSP will provide a breakdown of samples to be analyzed through the Contract Laboratory Program (CLP) and the Delivery of Analytical Services (DAS) work assignment, as well as the justification for those decisions.

Site Management Plan (SMP)

The Site Management Plan, presented as a subsection of the SAP, will discuss the project organization, schedule, and responsibilities of personnel performing field investigation activities. The SMP also addresses site security, contingency procedures, site access control, and the projected field operations schedule.

Health and Safety Plan (HASP)

The Health and Safety Plan will detail site-specific health and safety information, including a hazard assessment, personnel training, health and safety equipment requirements, site operations monitoring procedures, and safe operating procedures. The purpose of the HASP is to provide adequate health and safety protection for all TtNUS and subcontractor personnel working on site.

4.1.7 Subtask 0130 - Project Management

TtNUS shall prepare monthly progress reports for a 13-month duration (July 1999 through July, 2000) documenting cost and technical performance status for each task during the reporting period in accordance with contract requirements. TtNUS shall report costs and level of effort (by P level) as well as cumulative amounts expended to date. Monthly invoices shall be prepared and submitted in accordance with the level of detail specified in the contract.

TtNUS shall attend an estimated three technical project meetings, provide documentation of meeting results, and communicate weekly with the RPM or, as appropriate, to report project status and to discuss future activities. It is assumed that these meetings will be held at their Boston offices.

4.1.8 Subtask 0140 — Subcontract Procurement and Support

This subtask includes activities required to procure, administer, monitor, and close-out one subcontract for Investigation-Derived Waste (IDW) characterization, transport, and disposal. Technical specifications will be developed based on EPA requirements and TtNUS standard operating procedures. Field oversight and monitoring of performance will be conducted under Task 0700.

Technical specifications and subcontract procurement for the DAS analyses will be performed under the DAS work assignment.

No pre-bid meetings are scheduled as the anticipated subcontract does not warrant it. TtNUS will evaluate the performance of subcontractors based on the technical specifications, cost, and the overall contract terms and conditions.

4.2 Task 0200 — Environmental Sampling

The objective of this task is to collect environmental data from the study area in support of the EPA Risk Assessments. Subtasks include mobilization/demobilization, residential soil sampling, bank soil and sediment sampling, aquatic sediment and surface water sampling. The plan for sample collection and the basis for the design of that plan will be provided in the Sampling and Analysis Plan (Subtask 2.1).

The sections that follow describe the numbers of samples and proposed analyses. A summary of the proposed samples is presented on Table 4-1. Table 4-1 and the text that follows references the portions of the study area as described in Section 2 of this Work Plan, and Figure 2-2.

For planning purposes it has been assumed that all samples will be collected and analyzed for a full suite of contaminants.

**TABLE 4-1
PROPOSED SAMPLE SUMMARY
DRAFT FINAL WORK PLAN
CENTREDALE MANOR SITE
NORTH PROVIDENCE, RHODE ISLAND**

SAMPLE TYPE	MEDIA	ANALYSIS	Centredale Reach	Centredale Wetlands	Allendale Pond Channel	Allendale Pond	Lymansville Reach	Lymansville Pond	Upstream & Tributaries	Total Field Samples	Quality Control Samples	TOTAL
Residential Soils (1)	Soil	Pesticides/PCBs (4)	NA	12	NA	54	24	0	0	90	24.0	114
		SVOCs (4)	NA	12	NA	54	24	0	0	90	24.0	114
		TAL Metals(4)	NA	12	NA	54	24	0	0	90	24.0	114
		Dioxin & HCX	NA	12	NA	54	24	0	0	90	30.0	120
Bank (2) (Recreational)	Sediment	Pesticides/PCBs	5	NA	NA	5	5	5	5	25	8.0	33
		SVOCs	5	NA	NA	5	5	5	5	25	8.0	33
		Dioxin & HCX	5	NA	NA	5	5	5	5	25	8.0	33
Aquatic Sediment Samples	Sediment	Pesticides/PCBs	5	10	5	10	5	10	5	50	12.5	63
		SVOCs	5	10	5	10	5	10	5	50	12.5	63
		TAL Metals	5	10	5	10	5	10	5	50	12.5	63
		TOC	5	10	5	10	5	10	5	50	5.0	55
		Grain Size	5	10	5	10	5	10	5	50	5.0	55
		Dioxin & HCX	5	10	5	10	5	10	5	50	16.0	66
		SEM and AVS	5	10	5	10	5	10	5	50	5.0	55
		% solids, moisture	5	10	5	10	5	10	5	50	0.0	50
Surface water Samples	Aqueous	Pesticides/PCBs(4)	5	10	5	NA	5	10	5	40	11.0	51
		SVOCs(4)	5	10	5	NA	5	10	5	40	11.0	51
		TAL Metals(4)	5	10	5	NA	5	10	5	40	11.0	51
		Dioxin & HCX	5	10	5	NA	5	10	5	40	14.0	54
Deep Sediment Samples (3)	Sediment	Pesticides/PCBs	6	4	6	10	4	8	4	42	11.4	53
		SVOCs	6	4	6	10	4	8	4	42	11.4	53
		TAL Metals	6	4	6	10	4	8	4	42	11.4	53
		Dioxin & HCX	6	4	6	10	4	8	4	42	14.4	56

- Notes:
- (1) Residential Sample estimates are based on three samples per residential property. Number of residential properties are estimated. No residential samples are scoped for areas downstream of the Lymansville reach, as previous samples did not indicate presence of dioxin at concentrations above 1ppb (ug/kg).
 - (2) Bank Samples are estimated on the number of probable public access points in each reach or area.
 - (3) Depth samples are estimated by pairs - two intervals per station. Locations will be split between aquatic and bank sediment stations.
 - (4) Analytes so noted will be determined by CLP analysis. Others will be DAS (see text).

4.2.1 Subtask 0210 – Mobilization/Demobilization

This subtask involves providing the necessary personnel, equipment, and materials for mobilization and demobilization from the study area to conduct the field investigation. Included in this subtask are identifying and obtaining/returning field equipment, supplies, etc. A 1-day field orientation meeting for all TtNUS Team members, including discussion of the health and safety protocols, will be held in the office by TtNUS prior to initiation of work. An on-site field orientation will also be conducted by TtNUS prior to initiation of the field work.

This subtask also includes developing field forms, completing up-front field tracking systems, and performing other similar field investigation support tasks.

4.2.2 Subtask 0220 – Residential Soil Sampling

This task includes sample collection of soils and deposited sediments from residential properties that are at elevations greater than the average water levels in the rivers and ponds, but within the 100-year flood zone as determined under Task 0120.

This effort has been scoped based on sampling residential properties adjacent to reaches of the river which have previously been found to have sediments containing dioxin at concentrations greater than 1 ppb. This includes the Centredale Reach, the Centredale Wetlands, Allendale Pond, and the Lymanville Reach, as shown on Figure 2-2.

Residential Access Agreements

Access will be acquired for up to 30 residential properties along the east shore of Allendale Pond and the Lymanville Reach of the river. It is anticipated that access will be requested by TtNUS on behalf of EPA using the following procedure: TtNUS will find the owners address through tax records at the town hall, and send a letter to each of the owners of these properties. TtNUS personnel will schedule a time for the sampling crew to

visit a week after the letter is mailed. Three attempts will be made to contact the owner by phone at different times of the day. All conditions of access requested by the owners will be recorded by the contact person, and documented in a second letter to the owner, confirming the appointment. If a property owner cannot be contacted, a final attempt will be made to visit the owner at the property itself, but if no contact can be made, the property will not be accessed or sampled.

It is estimated that these arrangements will require one technical hour per property, or 30 hours.

Residential Soil Sample Collection

Samples will be collected from residential properties within the 100-year flood zone but above the normal elevations of Allendale pond. It is estimated that three samples will be collected from each property from areas within the property boundaries as shown on the tax maps and/or as described by the owner. Samples will be collected from the 0-1 foot interval for residential risk exposure scenarios. Sample areas will be repaired with sod or topsoil to match the surrounding grade.

It is anticipated that a crew of three persons will be able to visit four properties per day, and collect samples, prepare chains of custody, package and ship samples to the analytical laboratory for CLP analysis of required analytical parameters (described in Task 0300).

4.2.3 Subtask 0230 – Bank (Recreational) Sediment/Soil Sampling

This effort was not identified as a separate task in the work assignment, but has been separated from sediment sampling to better define work efforts. This task will include collection of twenty-five soil samples and deposited sediments from banks and frequently used access points to the rivers and ponds. Data from these samples will be used to estimate recreational exposures in the EPA risk assessments.

This will include evaluation of the west shore of the river and ponds, as well as the dam areas and other areas for points used for access by the public to the water for fishing and boating. It is not anticipated that access to private properties will be required for this effort.

Review Greenway Plans and Locate High Access Areas

Under this task, any proposed greenway plans will be reviewed to identify possible future access points to the river and ponds. In addition, a site inspection will be conducted to identify areas that show evidence of past and current human use of the shorelines. This inspection shall be done by land and by water, and particular attention will be paid to the west shore of the ponds and river, and to the dam areas where residential properties do not block access to the water. High traffic points and possible access points shall be flagged for sample collection.

Collect Bank Soil/Sediment Samples

Samples will be collected from one riverbank and ponds in high traffic areas and possible access points identified as described above. Samples will be collected from the 0-0.5 foot interval as required for evaluation of recreational risk exposure scenarios.

It is anticipated that 20 such locations will be identified and sampled, in addition to five "background" locations (two upstream in the Woonasquatucket and one in each of the three tributaries to the river within the study area). The field crew will collect samples, prepare chains of custody and associated sample tracking documentation, package and ship samples to the analytical laboratory for DAS analysis of required analytical parameters (described in Task 0300).

4.2.4 Subtask 0240 – Sediment/ Surface Water Sampling

This task will include collection of surface water and sediment from the underwater areas of the rivers and ponds. This will include the now-drained Allendale pond. It is not anticipated that access to private properties will be required for this effort.

Aquatic sediment and surface water sampling

Samples will be collected from areas of fine depositional sediments. Samples will be collected from the 0-0.5 foot interval as required for evaluation of ecological risk exposure scenarios. Co-located with the sediment samples, surface water samples will be collected from a position immediately above the sediment surface.

It is anticipated that 45 stations will be sampled, in addition to five “background” locations (two upstream in the Woonasquatucket and one in each of the three tributaries to the river within the study area). The field crew will collect water and sediment samples, prepare chains of custody, package and ship samples to the analytical laboratory for DAS analysis (sediment) and CLP analysis (surface water) of required analytical parameters (described in Task 0300).

4.2.5 Subtask 0250 – Depth Sampling

Samples will be collected from anticipated historic depositional areas where contaminated sediments may have accumulated. These samples will be co-located with surface aquatic sediment stations, and bank stations, selected to form a transect across the river or impoundment.

It is anticipated that 21 stations will be revisited for depth sampling, and two additional depth intervals will be collected, the 0.5 to 1.0 - foot interval, and the 1.0 to 1.5 - foot interval, resulting in a total of 42 samples collected. The field crew will prepare chains of

custody, package and ship samples to the analytical laboratory for DAS analysis of required analytical parameters (described in Task 0300).

4.3 Task 0300 – Sample Analysis

Environmental samples will be analyzed in accordance with the DQOs presented in the SAP. QA/QC during sample analysis will be consistent with the precision, accuracy, representativeness, completeness, and comparability required by the specified category of data quality.

The samples obtained from the field work described above in Task 0200 will be analyzed under both the DAS and the CLP program: Bank soils/sediment, aquatic sediments, and deep sediments collected under tasks 0230, 0240, and 0250 will be analyzed under the DAS work assignment due to the anticipated concentrations of dioxin (greater than 1 ppb) and anticipated solids content below 30 percent). Residential soils and surface water collected under Tasks 0220 and 0240 will be analyzed by CLP laboratories because it is anticipated that dioxin concentrations are below 1 ppb.

The LOE for subcontracting the DAS analytical services is included under the DAS work assignment. No LOE will be incurred under this task. Only the costs for DAS analyses are included under this subtask.

Samples will be analyzed for dioxins and hexachloroxanthene (HCX), PCBs, semivolatile organic compounds (SVOCs), pesticides, metals, acid-volatile sulfides and simultaneously extracted metals (AVS and SEM), total organic carbon (TOC), grain size distribution, percent moisture or percent solids. Table 4-1 presents a summary of analytical parameters and numbers of samples that are anticipated under this work assignment.

Although the work assignment requests analysis of PCB congeners, TtNUS proposes Aroclor analysis. During a conversations held with EPA on August 16, 1999, it was agreed that because the concentrations of PCBs in sediment were low as found in previous

sampling efforts (most concentrations within the 1 ppm range or lower), the Aroclor analysis is adequate for providing data to estimate human risk.

4.4 Task 0400 – Analytical Support

This task includes coordinating with EPA Region I Sample Control Center (RSCC), the Contract Laboratory Analytical Services Support (CLASS), and the EPA New England Office of Environmental Measures and Evaluation (OEME). In addition, this task includes LOE for DAS and CLP laboratory management tracking performance evaluation samples from EPA, and providing analytical support to field and project activities. This task also includes archiving sample data packages at the conclusion of the data validation.

TtNUS will develop templates for data collection that will ease the transfer of data from laboratory format to report format. TtNUS will receive electronic data from analytical laboratories and will format this data for input into a database currently being assembled by EPA and TtNUS.

4.5 Task 0500 – Data Validation

Tier II data validation will be performed for all analytical results of pesticides, PCBs, SVOCs, metals, and the AVS/SEM. Tier I will be performed for grain size, and TOC results. It is anticipated that dioxin data will be validated by EPA.

Data validation will follow the procedures described in EPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics 6/88, and modified by EPA Region I in February, 1989; EPA Region I Laboratory Data Validation Functional Guidelines of Evaluating Inorganics Analyses 2/88, and modified by EPA Region I in November 1988; and Volatile/Semivolatile Data Validates Functional Guidelines – Part II. Region I EPA New England, December 1996.

4.6 Task 0600 – Data Evaluation and Reporting

TtNUS will develop a Technical Memorandum that will summarize data collected for the Woonasquatucket study river and wetlands study area.

Useable data entered into the Data Management System as a part of Task 0113 will be summarized in data tables. Subsequent tables and site maps will then be generated to evaluate contamination distribution. These tables and figures will be included in the Technical Memorandum.

4.6.1 Subtask 0610 – Data Usability Evaluation

The evaluation of data for usability involves evaluating the available data received from IT and EPA for quality, and rejecting unusable data (data of unacceptable quality).

For this project, it is assumed that the data received from EPA and IT has been evaluated and checked for completeness and acceptable quality. Therefore, this task will be limited to importing this data into the GIS system and Centredale data management system, and checking the resulting database to assure that stations are assigned for each data point.

4.6.2 Subtask 0620 – Data Reduction, Tabulation, and Evaluation

Data evaluation is the process of reviewing and summarizing data into a format useful for evaluating the nature and extent of contamination and assessing risk. Both new and previously collected data will be incorporated into the Centredale GIS system. New data collected by TtNUS will be depicted on figures developed through GIS.

Previously collected data will be provided to TtNUS by EPA and their contractors. New data collected under this work assignment will be provided by the analytical laboratories in electronic format. All new and previously collected data will be compiled by TtNUS into a site chemical database and Data Management System. The Data Management System

site chemical database and Data Management System. The Data Management System will be used both by EPA and TtNUS to prepare summary tables and figures of sample and results information. Data to be compiled into the Data Management System Database includes:

- Sediment results from limited sampling reported July 31, 1998 (USEPA)
- Sediment and surface soil results from sampling reported March 9, 1999 (Weston-START)
- Soil results from Centredale and Brook Village properties collected by USEPA ERRS-I in summer of 1999
- All data collected by TtNUS as a part of Tasks 0200 and 0300 as described in this work plan.

Because data will be delivered in electronic format, and it is presumed that the format is compatible with TtNUS Data Management System, the bulk of this effort consists of preparation of contaminant distribution maps from the GIS that will be utilized by EPA scientists performing risk assessments. Per EPA request, the following presumptions are made:

- TtNUS will prepare eight D-size maps (24x36) showing contaminant concentrations measured in the study area. The eight maps will show two contaminant groups in two media at the two sections of the study area.
- Previously collected sample stations will be shown on these maps, but data will not be shown for those stations. Only contaminant concentrations identified by TtNUS' sampling and analysis effort will be depicted on maps prepared under this subtask.

4.6.3 Subtasks 0630 and 0640 - Data Trend Evaluation and Submission of Technical Memorandum

TtNUS will prepare a Technical Memorandum that summarizes the results of the data evaluation conducted under subtasks 0610 and 0620. The report will identify all data sources evaluated, discuss the quality and usability of the data, present TtNUS's interpretation of the data, and identify any remaining data gaps or limitations. It is assumed that four copies of the technical memorandum will be submitted to EPA.

The report will be submitted to the EPA RPM for review and comment. After the RPM's review, TtNUS will meet with the EPA RPM to discuss the data evaluation results and other activities needed. One revision of the Technical Memorandum will be provided, if necessary. The LOE for this meeting is under Subtask 0132, Routine Meetings and Communications.

The Technical Memorandum will also make recommendations (if appropriate) for future data collection and evaluation efforts that would be necessary to support the risk assessments to be performed by the EPA.

4.7 Task 0700 – Characterization and Disposal of IDW

This task includes work efforts necessary to characterize and dispose of wastes generated by sampling activities. TtNUS shall characterize and dispose of wastes in accordance with local, state and Federal regulations. It is anticipated that a minimal amount of wastes will be generated by the sampling activity, including decontaminated sampling gear, decontamination fluids and residual soils and sediment from sample collection procedures.

4.8 Task 0800 - Work Assignment Closeout

The following subtasks describe activities to be conducted under Work Assignment Closeout.

4.8.1 Return Documents to Government

Activities associated with returning required documents to EPA will be conducted under this subtask.

4.8.2 File Duplication/Distribution/Storage

Activities associated with duplicating, distributing, and storing project file materials will be conducted under this subtask.

4.8.3 File Archiving

Activities associated with archiving project file materials will be conducted under this subtask.

4.8.4 Prepare Closeout Report

Under this subtask the Work Assignment Closeout Report (WACR) will be prepared, to include a breakdown of final costs and Level of Effort expended, by P-level, as specified in the EPA Statement of Work. The WACR will be submitted to EPA in electronic format.

5.0 PROJECT MANAGEMENT

The overall TtNUS project management and control of the technical assistance support activities are presented below.

5.1 Project Organization

Mr. George Gardner, the Program Manager, is responsible for the overall management and implementation of the RAC I contract performed in US EPA Region 1. Mr. Stephen Parker will serve as the project manager for Work Assignment 043-ANLA-O16P and has the primary responsibility for the implementation and execution of the Work Assignment including technical quality, oversight/review, control of costs and schedule, and implementation of appropriate quality assurance procedures during all phases. In general, the technical disciplines and technical staffing will be drawn from the TtNUS's Wilmington, Massachusetts, office. When specialized or additional support is required, personnel from other TtNUS offices may be used. Figure 5-1 presents the project organization, the lines of authority, and coordination.

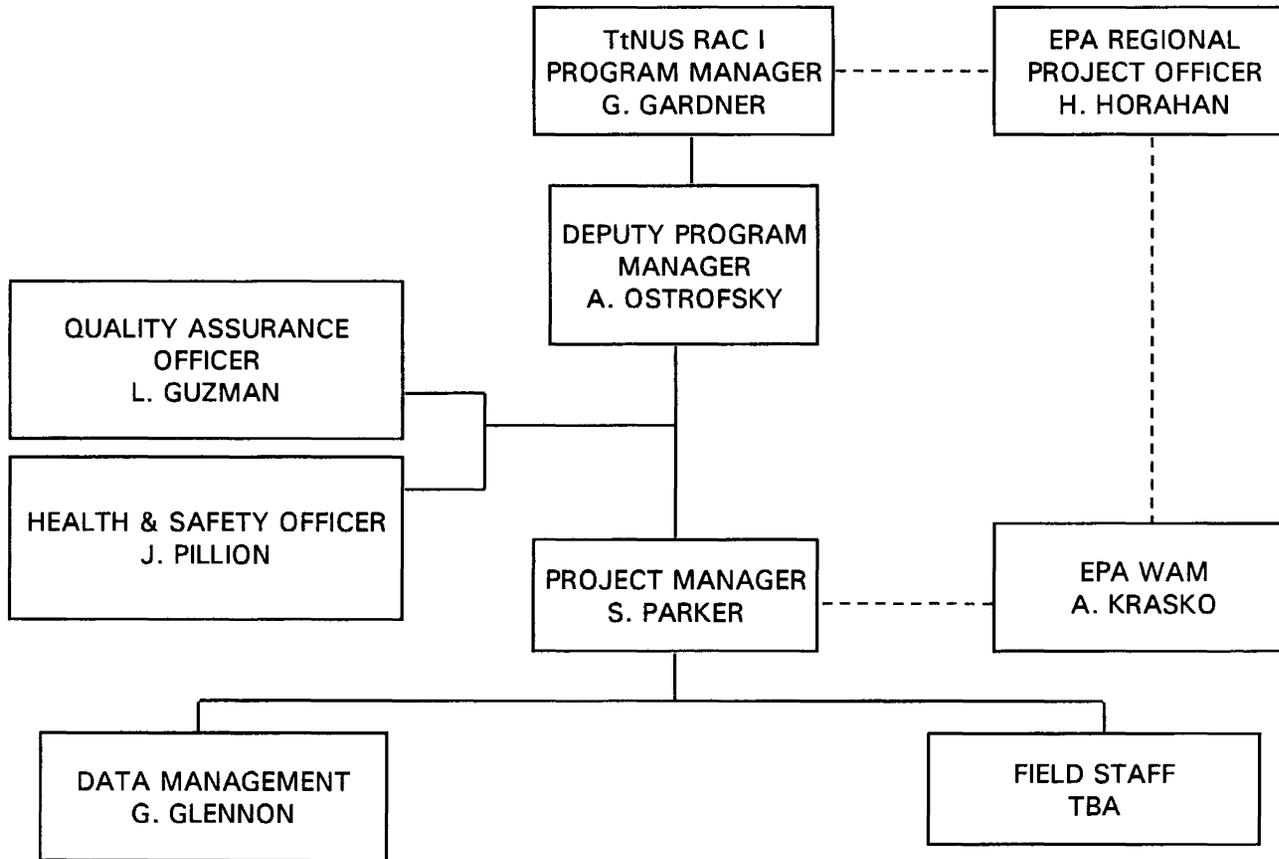
5.2 Quality Assurance and Data Management

All quality assurance and data management work shall be performed in accordance with the TtNUS RAC I QA Program Plan.

5.3 Project Schedule

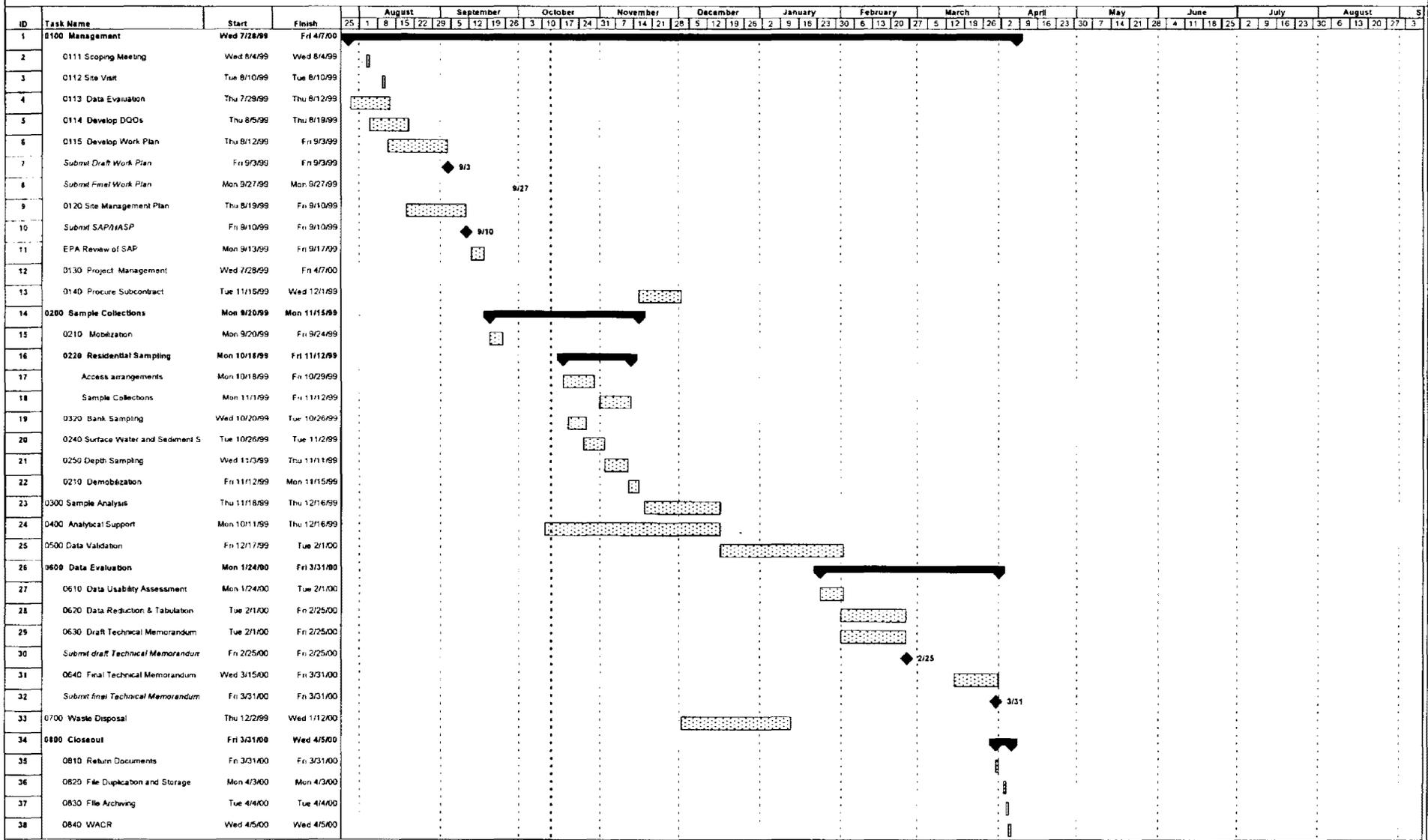
The project schedule is presented in Figure 5-2. The schedule begins upon concurrently with preparation of the Work Plan. The final deliverable for this work assignment, which is the final Technical Memorandum for Field Investigations, will be submitted to the EPA by July 31, 2000.

FIGURE 5-1
 PROJECT ORGANIZATION
 DRAFT FINAL WORK PLAN
 TECHNICAL ASSISTANCE: WOONASQUATUCKET RIVER SEDIMENT INVESTIGATION
 CENTREDALE MANOR SITE, NORTH PROVIDENCE, RHODE ISLAND



Note: _____ Line of communication, direction, and authority
 ----- Line of communication and coordination

**FIGURE 5-2
PROPOSED SCHEDULE, RAC I WA 043
WOONASQUATUCKET RIVER SEDIMENT INVESTIGATION
CENTREDALE MANOR SITE**



R199335DF

5-3

Centredale Manor 01

Project: Centredale Manor (Metro A&N)
Date: Wed 10/13/99

Task: [Pattern] Milestone: [Diamond] Rolled Up Task: [Pattern] Rolled Up Progress: [Pattern] Project Summary: [Pattern] Rolled Up Split: [Pattern]

Progress: [Pattern] Summary: [Pattern] Rolled Up Milestone: [Diamond] External Tasks: [Pattern] Split: [Pattern]

DRAFT FINAL

5.4 **Project Cost**

The overall cost for the performance of the technical assistance as described in this Work Plan is presented in a separate document, the Detailed Costing Estimate.

6.0 EQUIPMENT AND SUPPLIES

The following equipment and supply needs are anticipated during the performance of the field activities. See also the Draft Final Detailed Cost Estimate for other equipment details.

Non-Expendable Equipment

- Work Vehicles: 1 Box Truck, and 1 cargo van)
- Hand augers and trenching shovels
- Ponar sediment grab sampler
- Shelby tube sediment sampler
- Kemmerer water sampler
- Two-way radios (2)
- Photoionization detector (with calibration kits, chargers, and calibration gas) (Photovac 2020 or equivalent)
- Personal Protection Equipment for Level D use
- Cameras
- Tool kits with sockets, wrenches, pliers, screwdrivers, wire cutters, shears, hammers, etc.
- GPS unit with sub-meter accuracy
- One Computer
- Small boat with electric motor for access to Lymanville Pond

Consumable Supplies

- Health and Safety: Tyvek coveralls, rain gear, work gloves, disposable gloves, nitrile/butyl gloves, glove liners, overboots, safety vests, handwarmers, winter coveralls, hard hats, earplugs, safety glasses, goggles, first aid kits, fire extinguishers, portable (hand held) eye wash station, and caution tape.

- Decontamination Supplies: Tubs, brushes, spray bottles, garden sprayers, detergent rinses (Alconox or Liquinox), isopropyl alcohol, garbage bags, foil, buckets, plastic sheets, wash tubs, aluminum foil, DIUF water, 1" poly tubing and 55-gallon drums.
- Sampling Supplies: Coolers, tape (duct, strapping, and packing), stainless steel bowls, vermiculite, ice, trash bags, trowels, tape gun, zip-loc bags, preservatives (acids, bases), bottles, drums, pH paper, and pipets.
- Documentation supplies: Logbooks, disposable camera, film, batteries, sample labels, drum ID tags, and clip boards.
- Miscellaneous: Flagging, paper towels, polyethylene rope, polyethylene sheeting, hand trucks, gas cans, drum trucks, steel or fiber tapes (100- and 200-foot lengths), wire brush, sledge hammer, tarp, traffic cones, electrical tape, car battery, battery charger, bung wrench, flagging, and grade stakes.
- Sample Containers: 2, 4, and 8 oz. wide mouth glass soil jars, 80-oz amber jugs, 1-liter amber jars, and 1-liter polyethylene bottles. Sample containers are costed for CLP analysis only, residential and surface water samples). The DAS laboratory will provide containers for sediment samples.