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US ARMY CORPS
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Final Work Plan

**Centredale Manor
Surface Water Sample Collection
At Upstream and Downstream Locations**

**Centredale Manor Restoration
Project Superfund Site
North Providence, Rhode Island**



**Final Work Plan
Surface Water Sample Collection at Upstream and Downstream Locations
Centredale Manor Restoration Project Superfund Site**

Prepared for:

U.S. Army Corps of Engineers, New England District

December 6, 2004

Prepared by:

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INTRODUCTION

This work plan is based on the scope of work provided by the U.S. Army Corps of Engineers (COE) dated October 15, 2004. This work will be performed under Task Order No. 01 for Contract No. DACW33-01-D-0004, *Centredale Manor Restoration Project Superfund Site*. Sampling will be conducted at the Centredale Manor Restoration Project (CMRP) site in North Providence, Rhode Island. Surface water samples will be collected from an upstream location near Route 44, immediately upstream of the Allendale Dam, and immediately upstream of the Lyman Mill Dam (Figure 1). Samples will be collected at each of these locations three times over a two week period. Samples will be analyzed for dioxin/furans. The results will be compared to the 1999 TTNUS data collection effort to verify the initial analysis of dioxin water column concentrations presented in the *Final Technical Memorandum Sediment Stability Study* (November 2004). The surface water sample collection and analysis will be conducted in accordance with the following documents:

Technical Memorandum, Woonasquatucket River Sediment Investigation (TTNUS, 2000).

Final Quality Assurance Project Plan Addendum, Interim Data Collection, Centredale Manor Restoration Project Site (QAPP Addendum; September, 2002), as modified in the Errata Sheet (November, 2002).

Final Health and Safety Plan for the Human Health and Ecological Risk Assessment for the Centredale Manor Restoration Project Superfund Site., (HASP; May, 2002)

Surface water sample collection and sample analysis details are provided below.

SURFACE WATER SAMPLE COLLECTION

A total of nine surface water samples will be collected from the three locations shown in Figure 1. At the Lyman Mill Dam and Allendale Dam locations, the samples will be collected from the dam abutments on the eastern side of the river. At the upstream sampling location, samples will be collected in the center of the channel at the Route 44 bridge. Three separate sampling events will occur during a two-week time window. During each sampling event, one surface water sample will be collected from each of the three locations. Samples will be collected under non-resuspending conditions. To ensure that this requirement is met, field personnel will monitor local precipitation forecasts as well as the USGS stream flow gauge #01114500 for the Woonasquatucket River at Centredale, RI (http://waterdata.usgs.gov/ri/nwis/uv/?site_no=01114500&PARAMeter_cd=00065,00060). The 62 year average flow rate for December is 85 ft³/second. On December 1, 2004, flow rates exceeded 200 ft³/second as a result of 1.37" of rain on that date. Flow rates declined steadily following this event and were <100 ft³/second as of December 6, 2004. The sampling program will target flows of <100 ft³/second (the flow rate for a flood with a 5-year return period is 894 ft³/second). Actual sampling events will be scheduled to meet this condition. Precipitation and flow rate data will be collected and included in the field sampling report. Additionally, the sampling team will not collect samples if the water is visibly turbid.

Field methods will follow the same protocol as used in the 1999 TTNUS data collection effort:

- Water depth will be carefully measured at the station location so that the sediment will remain undisturbed.
- The sampling bottle will be lowered to the desired depth (approximately one foot above the sediment surface) and closed via a "messenger". The water will be transferred to the appropriate sample containers (1-L amber glass bottles) and stored cold (4±2°C).

- *In situ* measurements of temperature, conductivity, salinity will be conducted at each location using a YSI model 33.
- Measurements of pH will be conducted with an Oakton pH Tester2.
- Latitude and Longitude of each sample location will be determined using a handheld Garmin Promark IV Global Positioning System (GPS) unit.

All samples will be obtained using manual sampling techniques. Sample station coordinates will be acquired with a handheld GPS at the time of sampling. The estimated position error of the GPS unit is 3-4 m. In addition to recording the satellite acquired coordinates, at each sampling location the field team will describe the physical location of the sample station (e.g. "at NE edge of dam abutment). Table 1 lists the sample ID numbers which will be assigned to samples collect during this survey. Sample container, volume requirements, storage conditions, holding times and receiving laboratories are defined in Table 2.

Table 1. Sample IDs for Surface Water Sampling.

Matrix	Sample ID	Sample location	Sampling Event	Analysis
Surface Water	RWR-SW-6001-0000-01	Upstream	1	Dioxin/furan only
Surface Water	RWR-SW-6001-0000-02	Upstream	2	Dioxin/furan only
Surface Water	RWR-SW-6001-0000-03	Upstream	3	Dioxin/furan only
Surface Water	APB-SW-6001-0000-01	Allendale Dam	1	Dioxin/furan only
Surface Water	APB-SW-6001-0000-02	Allendale Dam	2	Dioxin/furan only
Surface Water	APB-SW-6001-0000-03	Allendale Dam	3	Dioxin/furan only
Surface Water	LPX-SW-6001-0000-01	Lyman Mill Dam	1	Dioxin/furan only
Surface Water	LPX-SW-6001-0000-02	Lyman Mill Dam	2	Dioxin/furan only
Surface Water	LPX-SW-6001-0000-03	Lyman Mill Dam	3	Dioxin/furan only

Solid Investigation-Derived Waste (IDW) will include personal protective equipment (e.g. nitrile gloves). Decontamination in the field will not be necessary, as dedicated sampling equipment will be used. No field rinsate blank will be collected. Battelle's sub-contractor, ONYX Environmental, will be responsible for the transportation and disposal of the solid IDW (dioxin bearing, non-F027 listed waste).

Table 2. Sample Container, Sample Size, Preservation Requirements, Holding Times and Analytical Laboratories.

Analytical Parameter	Minimum Sample Volume	Containers	Preservation Requirements	Maximum Holding Time (preparation/analysis)	Laboratory for Shipping
Dioxin/Furan	Full (1/2" headspace)	1-L amber glass bottle 2 bottles for each sample + At Upstream location collect 4 extra bottles for preparation of MS (2 bottles) and MSD (2 bottles) QC samples	Cold (4±2°C)	1-year (a)	Henry Pham Battelle Columbus 505 King Avenue Columbus, OH (614-424-7849)

(a) Per EPA Method 1613, Rev.B for dioxin/furan, aqueous samples may be stored for up to one year if stored as described in the method.

SAMPLE ANALYSIS

Each of the samples will be analyzed for dioxins/furans. Dioxin/furan analyses will be conducted in accordance with the *Final Quality Assurance Project Plan Addendum, Interim Data Collection, Centredale Manor Restoration Project Site* (QAPP Addendum; September, 2002), as modified in the Errata Sheet (November, 2002), with the following exceptions:

- a. Surface water samples will be analyzed for dioxin/furan compounds listed in EPA-NE QAPP Worksheet #9b of the final QAPP Addendum (September, 2002; page 61 of 218); no other analytical parameters will be tested (e.g., HCX, metals).
- b. The F-020 waste classification was removed by EPA effective December 19, 2002. Solid IDW will be disposed of as dioxin-bearing, non F-027 waste. Wastes from the project will be treated as routine laboratory waste, unless notified otherwise in writing from USEPA.
- c. A field duplicate will not be collected.
- d. Laboratory-based QC samples will include one procedural blank (PB), one laboratory control sample (LCS), one matrix spike (MS), and one matrix spike duplicate (MSD).

Samples will be stored at Battelle for a period of up to 6 months, after which samples will either be disposed or returned to the COE.

DATA MANAGEMENT AND REPORTING

Laboratory data will be submitted for third party validation as specified in the QAPP Addendum (September, 2002). USEPA Region 1 will be responsible for third party validation of the dioxin/furan data.

Field and final, validated analytical data will be loaded into the project database in accordance with the *Final Data Management Plan Update, Interim Data Collection, Centredale Manor Restoration Project Site* (DMP Update; September, 2002), as modified in the *Addendum to the Data Management Plan* (January, 2004). Battelle will be responsible for providing final, validated dioxin/furan data in electronic format as specified in the DMP.

Surface water sample collection and analysis results will be provided in a letter report that will briefly describe the methods and results of the sampling effort. The letter report will include tables of the final, validated data and a map showing the sample locations. The letter report will be a combined report, including results from companion field investigations planned for the site (e.g., groundwater, sediment). The letter report will be prepared and submitted once data from all field investigations (e.g., surface water, groundwater, sediment) are available as final, validated data.

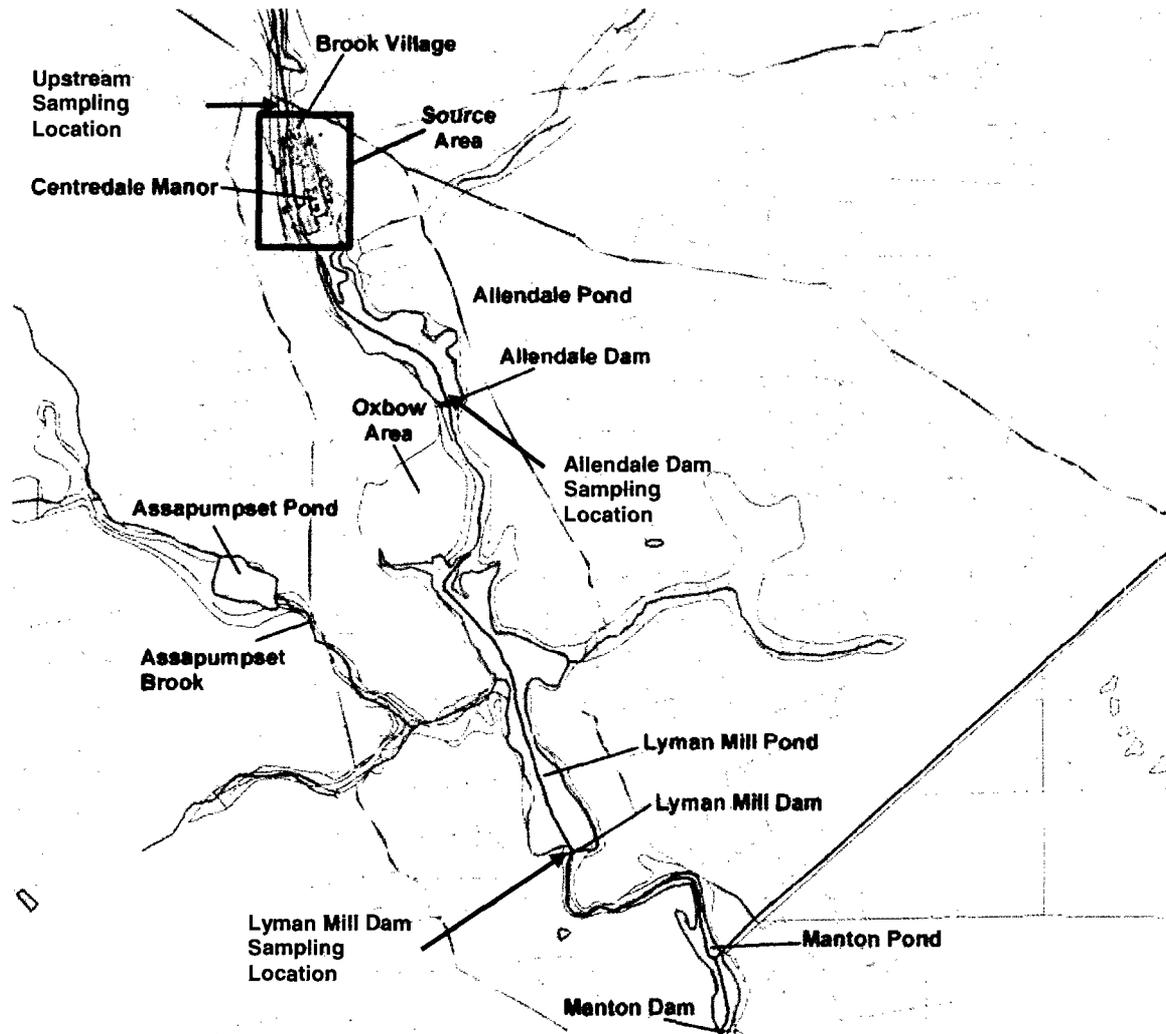


Figure 1. Surface Water Sample Collection Locations at the CMRP Site.