

1.0 INTRODUCTION

The NUS Corporation Region I Field Investigation Team (NUS/FIT) was directed by the Region I Waste Management Division (Superfund Branch) of the U.S. Environmental Protection Agency (EPA) under Technical Directive Document (TDD) Nos. F1-8311-06, F1-8405-02, and F1-8409-01 to conduct a hydrogeologic Remedial Investigation of the Wells G & H site in Woburn, Massachusetts. This report constitutes Part I of a two part investigation. The second part, a contaminant source characterization and assessment of the environmental impact of waste disposal activities, is also being conducted by GCA. This report presents the description, results, and conclusions of the hydrogeologic Remedial Investigation (Part I). GCA will submit Part II of the Remedial Investigation (source characterization and assessment) as a separate document. The Feasibility Study will include an Endangerment Assessment that will summarize the hazardous compounds of concern, assess the significance of contamination migration routes and exposure pathways, and evaluate endangerment to public health, biota, natural resources, and wetlands.

NUS/FIT was directed to develop a Scope of Work for a Hydrogeologic Field Investigation of the Wells G & H site to identify the source(s) of contamination to Wells G & H and to provide data to support the Feasibility study (TDDs F1-8311-06, F1-8405-02 and F1-8409-01). The Scope of Work for the Remedial Investigation is presented in Appendix A. The Remedial Investigation was divided into two phases. Phase I consisted of initial planning, procurement, and sampling activities; and Phase II included the subsequent site investigation activities. Phase I activities included:

- review of existing data
- planning site access and preparation of a base map
- procurement of subcontractors
- mobilization of equipment
- performance of an initial round of environmental sampling

Phase II activities included:

- installation of groundwater monitoring wells
- in-situ permeability testing and grain size analysis
- ground and surface water sampling for chemical analysis
- vertical and horizontal datum control surveying
- aquifer testing

A chronological summary of NUS/FIT activities is presented in Table 1-1.

The United States Geological Survey (USGS), through a cooperative agreement with EPA, designed an aquifer test and recommended the installation of additional monitoring wells to provide water level measuring points. EPA subcontracted the installation of these monitoring wells to the US Army Corps of Engineers (COE). Geologic data collected by the COE during monitoring well installation is included in Appendix B. An aquifer test report describing the area of influence and zone of contribution to Wells G & H will be released by USGS.

The following is a brief summary of subsequent chapters:

- Chapter 2 presents site history and discusses the scope and findings of investigations conducted by EPA, DEQE, and consultants active in the area.
- Chapter 3 describes the methods used by NUS/FIT to conduct the Remedial Investigation.
- Chapter 4 discusses the geologic and hydrologic setting of the site.
- Chapter 5 presents the analytical results of the Remedial Investigation.
- Chapter 6 is a summary of conclusions regarding the nature and extent of contamination at the site.

TABLE 1-1
CHRONOLOGICAL SUMMARY OF NUS/FIT INVOLVEMENT

29 November 1983	TDD No. F1-8311-06 issued by EPA to prepare a Scope of Work for a Field Investigation
13 January 1984	Draft Scope of Work for a Field Investigation of the Wells G & H Site submitted to EPA.
January February 1984	Meetings were held between NUS/FIT, GCA, EPA, and DEQE to discuss data needs of the Feasibility Study and review comments on the scope of work.
07 May 1984	TDD No. F1-8405-02 issued by EPA to revise Scope of Work and begin Phase I activities.
11 June 1984	Draft Scope of Work for a Remedial Investigation submitted to EPA.
17-26 July 1984	Phase I Sampling conducted. Samples were analyzed by NUS/FIT for volatile organic compounds to prevent delays due to limited Contract Laboratory Program (CLP) regional allocations.
31 October 1985	Installation of 55 groundwater monitoring wells at 24 locations.
02-04 April 1985	Water levels measured in all newly installed wells and accessible existing wells in the study area.
April-Sept. 1985	Collection of water level measurements of selected monitoring wells.
April-June 1985	Groundwater and surface water environmental sampling conducted for CLP analysis.
11&30 November 1985	Ground surveying of monitoring wells conducted.
20 December 1985	Draft Remedial Investigation Report submitted to EPA.
17 October 1986	Final Remedial Investigation Report submitted to EPA.

1.1 Purpose and Objectives of the Remedial Investigation

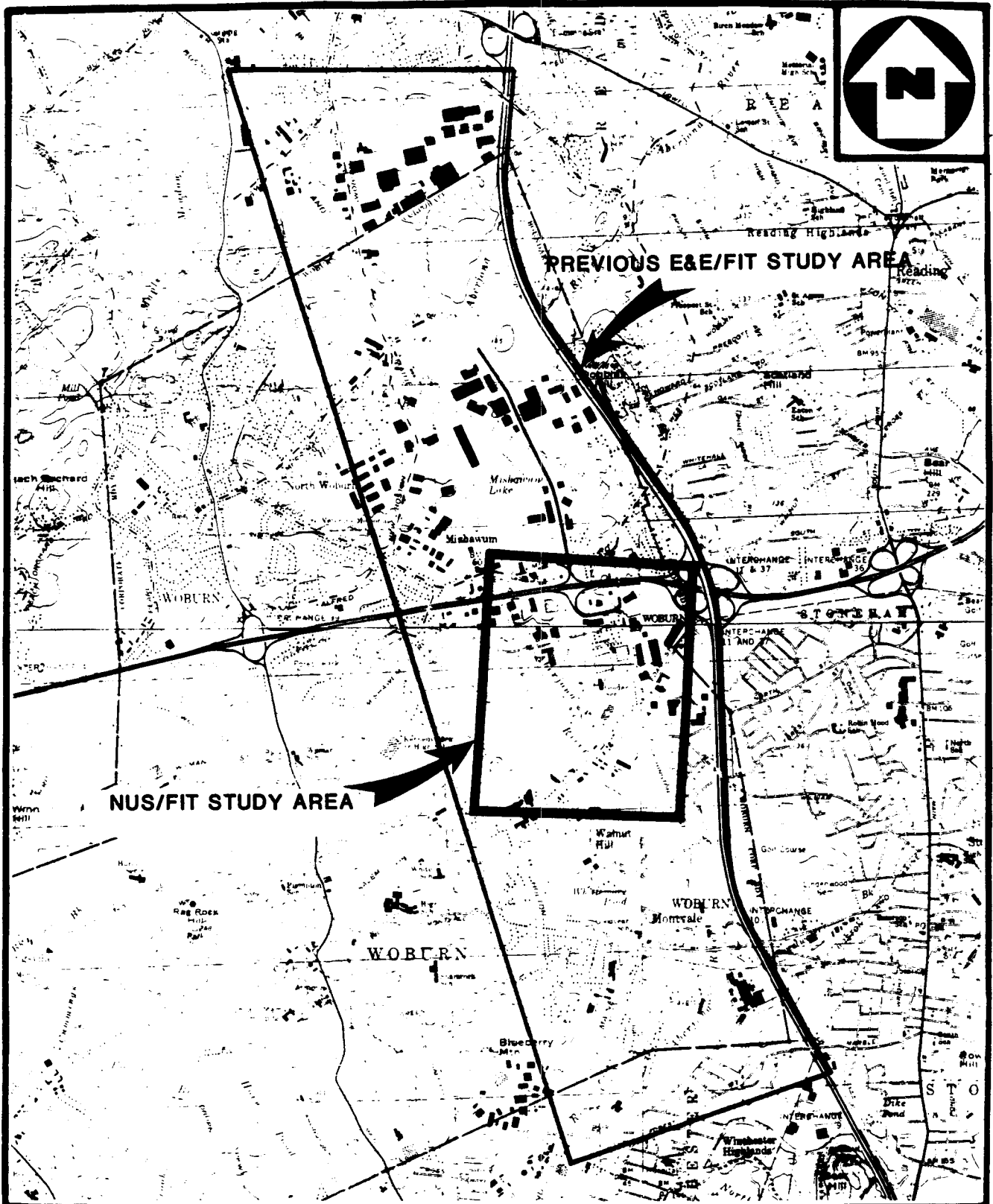
The purpose of the Remedial Investigation Part I is to determine the nature and extent of groundwater contamination at the Wells G & H site and to gather data to support the Feasibility Study. The investigation focused on collecting the data required to determine the need for and extent of remedial action, and for development and evaluation of remedial alternatives during the subsequent Feasibility Study. The data requirements specific to the Feasibility Study were established by GCA following preliminary evaluation of all potentially applicable remediation techniques.

The objectives of the Remedial Investigation were to provide sufficient information and interpretation to accomplish the following:

- Describe the hydrogeology of the Wells G & H aquifer area including surface water and groundwater movement, pathways and mechanisms of contaminant transport, and contaminant source areas.
- Develop a hydrogeologic and chemical database sufficient to support a Feasibility Study to identify and evaluate remedial alternatives for mitigating the effects of groundwater contamination at the Wells G & H aquifer area.
- Investigate suspected contaminant source areas, identify properties that have contributed contamination to the Wells G & H aquifer area, and collect information adequate to support enforcement actions and remediation or source control.

1.2 Site Description

The Wells G & H site is located approximately ten miles north of Boston within the City of Woburn, Massachusetts, at the approximate coordinates of 42° 29' 40" north and 71° 07' 52" west (Figure 1-1). The site is bounded to the north by State Route



SCALE :
 0 1/2
 mile
 APPROXIMATE

LOCATION MAP OF STUDY AREA
 WELLS G&H SITE
 WOBURN, MA

NUS
 CORPORATION
 A Halliburton Company

FIGURE 1-1

128 (Interstate Route 95), to the east by Interstate 93, to the south by Cedar Street and Salem Street, and to the west by Wildwood Avenue (Plate 1).

The Wells G & H site will also be referred to in this report as the Wells G & H aquifer area. The Wells G & H aquifer area is also geographically defined as the valley and surrounding uplands associated with the Aberjona River south of Interstate 95 and north of Salem Street. The aquifer area is hydrologically defined as the area (vertically and laterally) that is potentially capable of supplying water to Wells G & H under pumping conditions. The study area encompasses and is somewhat larger than the Wells G & H aquifer area. The northern and southern boundaries of the site are located where background levels of groundwater contamination can be demonstrated.

The study area, approximately 450 acres, encompasses highly developed light commercial and light industrial parks bordering the swampy terrain associated with the Aberjona River floodplain. The Aberjona River flows south through the center of the site and splits into two main channels south of Olympia Avenue. These two main branches converge to form a single channel approximately 1,000 feet downstream from the divergence. Swampy terrain exists between the two channels and also extends at least 400 feet on either side of the river. The Woburn Municipal Wells G & H are located on small man-made knolls of land to the east of the river. Massachusetts Rifle Association property and a residential development near Dewey Avenue are located northeast of the well field, and several residences are located east and south of the well field. Residential development dominates the areas outside of the study area to the east, south, and west. The Industriplex Superfund site is located north and upgradient of Wells G & H. Industriplex consists of a 244-acre industrial park. A Remedial Investigation and Feasibility Study of the Industriplex site has been completed and has been reviewed by EPA. The Wells G & H Remedial Investigation discusses groundwater contamination at Industriplex and its impact on the Wells G & H aquifer area.

Surface elevations rise from 43 feet above mean sea level (MSL) at the Aberjona River to a maximum elevation of 120 feet in the northeast corner of the site. The

elevation of the Aberjona River decreases by approximately five feet from north to south across the site. Surface drainage is affected by a large amount of impervious surface (pavement and parking lots); most of the surface water runoff is directed towards the river via culverts. Two man-made ponds collect runoff in the Wildwood Avenue industrial park. Runoff to these ponds drains via an unnamed stream to the Aberjona River.