Appendix A

Work Plan: An Occupational Health Investigation of Cancers among Fire Fighters in Anne Arundel County, Maryland
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An Occupational Health Investigation of Cancers Among Fire Fighters in Anne Arundel County, Maryland

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Introduction

This document provides the working plan that will be followed by the team from the Johns Hopkins Bloomberg School of Public Health in carrying out a nine-month investigation of cancers among fire fighters in Anne Arundel County, Maryland. The work plan meets the anticipated scope of activities that can be carried out, based on the time-frame of the study (July 1, 2004, through March 31, 2005) and the funding provided by the Department of Health and Mental Hygiene. While an expanded scope of work may be needed for a follow-up, more comprehensive investigation of cancers among fire fighters in Anne Arundel County Maryland, this work plan is constrained by the resources and time available, and hence recommendations for a broader study may be one product of this nine-month study.

The proposed work plan will involve review and analysis of already published information that is relevant to cancer among fire fighters in general, as well as more specific investigation related to fire fighters in Anne Arundel County. These two aspects of the project are described below.

Literature Review and Evaluation:

To establish a foundation of evidence for interpreting findings among the Anne Arundel County fire fighters, the Johns Hopkins team will carry out systematic reviews of relevant evidence in the peer-reviewed literature. Based on understanding of the concerns at the start of the investigation, we propose to do the following: 1) carry out a systematic review of prior studies on cancer in fire fighters; 2) examine the literature on
cancer risk associated with exposure to polychlorinated biphenyls (PCBs); 3) systematically review the literature on occupation and brain cancer, focusing on studies providing information on brain cancer among fire fighters; and 4) screen the literature to identify biomarkers of exposure or outcome that may be applicable to the Anne Arundel County fire fighters. More detailed methods for these activities are provided below.

We will use the well-established approach of carrying out systematic reviews for these topics. The methodology is straightforward, and will involve the use of specified search criteria to explore the published literature for relevant studies, systematic review and evaluation of each relevant study, the creation of a database of evidence providing the findings of each study, and a comprehensive review and summary and interpretation of the findings. The set of review topics involves an extensive body of evidence, and with available resources, we will not be able to systematically and comprehensively review each of these topics. We do anticipate, however, gathering all available evidence on cancer among fire fighters, and also on risks of brain cancer among fire fighters. For biomarkers and PCBs, the search will be more directed.

**Describing the Cancer Cluster**

A first step in investigation of any cancer cluster involves the characterization of the cluster to be addressed. Clusters are defined by the occurrence of unusual groupings of cases by place, person, time, or by some combination of these factors. In this instance, we have been informed that the index cluster comprises perhaps four cases of brain cancer among fire fighters sharing exposure to smoke generated by training fires
involving the combustion of fuel contaminated by PCBs during the 1970s. To assure that the cluster is well-defined, and other concerns of stakeholders are addressed, we will obtain information concerning the cluster-defining cases, and also work with stakeholder groups to assure that any other health-related concerns are addressed by the investigation.

For this purpose, we intend to develop a working definition of the cluster and then obtain information on the numbers and characteristics of the cases that define the cluster. This information will be obtained from a variety of sources, including the Anne Arundel County Fire Department, stakeholder groups, and media reports. We intend to meet with families or with fire fighters and former fire fighters who have developed cancer. Broader stakeholder meetings will be held to assure that other possible concerns are heard so that any final report will address concerns voiced from the outset.

**Evaluation of the Potential to Conduct an Epidemiological Study**

One goal of the nine-month project will be to assess the feasibility of a formal epidemiological study of risk for cancer incidence and mortality among Anne Arundel County fire fighters, particularly those who were employed during a time window when there was potential for exposure to the training fires. This type of study would provide information on the rate of cancer occurrence in these fire fighters, so that a comparison could be made to unexposed fire fighters, if a comparison group could be developed, or to the general population of the state of Maryland. The data resources needed for this type of study include a roster of the exposed fire fighters (and any comparison group)
with sufficient detail so that matching of individuals could be carried out against such resources as the Maryland Cancer Registry or the National Death Index. Preferably, information is available on name, birth date, and Social Security Number. This type of study would be strengthened by the availability of information on the extent of contact with training fires or the training facility. One very basic measure would be the number of times that individuals had participated in activities involving the burning of the contaminated fuel, to the extent that such retrospective exposure classification is possible.

**Preparation of a Final Report**

One evident overall goal is the preparation of a final report that provides a complete picture of what is known about cancer risks and fire fighters generally and in Anne Arundel County fire fighters, and specifically the PCB exposed cohort. A non-technical report will be prepared for this purpose that will communicate the findings of this work and provide specific statements as to what is known and where uncertainties lie. The report will outline recommended next steps, whether related to future monitoring of exposed fire fighters, or for further research. We will communicate the findings of the report to the various concerned groups as well as to the Department of Health and Mental Hygiene.