

A PROTOCOL FOR DOCUMENTING AND INVESTIGATING SYMPTOMS  
REPORTED NEAR BIOSOLIDS LAND APPLICATION SITES

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## INTRODUCTION AND OVERVIEW

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# A PROTOCOL FOR DOCUMENTING AND INVESTIGATING SYMPTOMS REPORTED NEAR BIOSOLIDS LAND APPLICATION SITES

## Introduction and Overview

In the U.S., treated sewage sludges, also known as biosolids, are routinely applied to agricultural lands as soil amendments. The National Academy of Sciences (2002) defined sewage sludge as “the solid, semi-solid, or liquid residue generated during treatment of domestic sewage,” and biosolids as “sewage sludge that has been treated to meet the land-application standards in [US EPA] Part 503 rule or any other equivalent land application standards.” The NAS recommended several types of studies to investigate potential adverse health effects of these practices. In addition to exposure studies and epidemiologic studies, the report called for “response studies,” for example, investigations of symptoms of illness reported by nearby residents following land application of biosolids.

Sometimes people who live near areas where biosolids are applied to land report symptoms and health problems to government agencies. This Investigation Protocol is intended for public officials to use when responding to such concerns. The starting point for the investigation is contact by a member of the public or clinician with a patient who has experienced symptoms that the patient and/or clinician believe could be connected to land application of biosolids.

The Investigation Protocol provides a standardized procedure for documenting (1) reported symptoms; (2) recent land application of biosolids in the vicinity; (3) the sources, amounts and characteristics of biosolids; (4) factors that could affect off-site migration of pollutants from land application sites; and (5) other exposures that could be related to reported symptoms of illness. In addition to providing a protocol for responding to reports of symptoms from specific areas, records of investigations should be entered into an electronic database that could be used to examine spatial patterns of reported concerns, temporal changes in the frequency or types of concerns, and relationships between reported concerns and the sources or characteristics of biosolids applied to land.

The Investigation Protocol involves five steps:

- Step 1** Health Questionnaire for Assessing Symptoms Potentially Related to Land Application of Biosolids
- Step 2** Site Identification and Source Report
- Step 3** Biosolids Generator Questionnaire
- Step 4** Biosolids Applier Questionnaire
- Step 5** Site Follow-Up Report

Figure 1 shows the stages of an investigation in response to one or more reports of health concerns. When a call or other contact (i.e. email, letter, etc.) is received, an initial decision must be made about whether the concern potentially relates to changes in the health of residents located near land application sites after biosolids (or an unknown soil amendment that might be biosolids) have been applied. If the concerns have to do exclusively with issues unrelated to recent changes in health or symptoms of illness (for example, the potential for future health effects from local application of biosolids, consumption of food grown on biosolids applied fields, or potential for future contamination of well water), the resident should be referred to appropriate educational materials and personnel, but this investigation protocol should not be administered.

If the concern relates to symptoms experienced following land application of biosolids or an unknown soil amendment that might be biosolids, the investigation should proceed. The first step in the Investigation Protocol is to complete the Health Questionnaire for Assessing Symptoms Potentially Related to Land Application of Biosolids. This questionnaire is designed to be administered as a telephone interview. If the responses to the Health Questionnaire indicate that the resident recently experienced or is currently experiencing symptoms, and if the responses suggest the possibility of recent nearby land application of biosolids, the investigation should proceed to Step 2 as described below. If the resident reports severe symptoms and ongoing or recent land application of biosolids or an unknown soil amendment that might be biosolids close to the resident's home, Step 5 should be initiated as quickly as possible and concurrently with Steps 2-4. The interviewer may be able to assist the concerned resident in contacting the appropriate parties to request that the land application be stopped, if desired.

Step 2 involves completion of the Site Identification & Source Report, in which the investigator records information about the locations of permitted biosolids land application site(s) within a mile of the resident's property and the holders of the permits. If there are permitted land application sites in the area, the investigation should proceed to Steps 3 and 4. If there are no permitted sites, the investigation should proceed to Step 5 to determine whether there has been local application of biosolids at sites that were not identified in the permit records.

Step 3 includes a Biosolids Generator Questionnaire. The Generator Questionnaire is used to record information about the sources of wastewater and sludge, biosolids preparation, generation, treatment, quality testing, storage, and management. It is designed to be administered as a telephone interview and to obtain information about treatment processes that could affect the presence of toxicants, pathogens, and odorant chemicals in biosolids applied to land.

Step 4 is the Biosolids Applier Questionnaire. The Applier Questionnaire is used to record information about hauling, land application methods, land application amounts, land application rates, and weather conditions during land application. Like the Generator Questionnaire, it is designed to be administered as a telephone interview, although some data may be collected from records. Depending on the state regulatory program, tracking biosolids application may be relatively easy or difficult. Some states require thorough record keeping, and some do not.

Step 5 is the Site Follow-Up Report. The Site Follow-Up Report is to be used for field evaluation of neighboring land uses, factors that could affect off-site migration of materials from land application sites (e.g. distances to residences, surface waters, vegetative buffers), vectors (e.g. insects, birds, pets), and potential for human exposure to other soil amendments (e.g. animal manures). The Site Follow-Up Report is designed to be completed during a site visit to the area of residence of the person(s) with health concerns.

When an investigation is complete the resulting information is entered into a database. If there is interest from members of the public, clinicians, environmental officials, or operators of wastewater treatment plants, a summary of results may be prepared for distribution. Investigators and agencies are encouraged to provide results of the investigation to individuals who reported symptoms.

The steps of the Investigation Protocol should be completed as quickly as feasible. The Protocol is intended to facilitate collection of common data for cases in which members of the public believe their health has been affected by biosolids. However, it is not intended to discourage investigators from obtaining additional information when it is needed for a public health response.